CCHCS Care Guide: Hypertension

SUMMARY | **DECISION SUPPORT** | **PATIENT EDUCATION/SELF MANAGEMENT**

CCHCS' BLOOD PRESSURE (BP) GOALS*

- **< 140/90 mmHg for most patients < 60 years old (yo)**
- **< 140-150/90 mmHg and shared decision-making for most patients > 60 yo**
- **< 130/80* mmHg for patients with atherosclerotic cardiovascular disease (ASCVD), chronic kidney disease (CKD), and diabetes (DM) patients at high risk for ASCVD**
- **< 140/90 for DM patients with no or low ASCVD risk**

ALERTS

- **Systolic BP > 180**
- **Diastolic BP > 120**
- **Evidence of target organ damage (TOD)**
- **Hypertension (HTN) with chest pain or symptoms of acute coronary syndrome**
- **Signs of secondary HTN**

*Note: Significant controversy still exists in the literature regarding target BP goals. CCHCS BP treatment thresholds are anchored on JNC8, however research supports a lower BP target for patients with ASCVD, chronic kidney disease, and ASCVD Risk > 10%. See page 6.

DIAGNOSTIC CRITERIA/EVALUATION

The definition of HTN varies depending on which guidelines are reviewed. Normal BP is accepted as < 120/80 mmHg. The Joint National Committee (JNC) released HTN guidelines, most recently JNC 8 in 2014. No further updates are planned. These were endorsed by the American College of Physicians (ACP) and American Academy of Family Practitioners (AAFP) in 2018.

- The American College of Cardiology (ACC) and the American Heart Association (AHA) released guidelines in 2017 which generated some controversy because of their lowering of the BP threshold needed to identify a person as having HTN (120-129 systolic).
- The European Guidelines released in 2018 were closely aligned with JNC 8 recommendations.

Hypertension Diagnostic Criteria and Treatment Goals*

Scientific Body	JNC 8- 2014		ACC/AHA-2017		European 2018	
	Definition	Treatment Recs.*	Definition	Treatment Recs.*	Definition	Treatment Recs.*
DIAGNOSTIC CRITERIA AND TREATMENT RECS. FOR HYPERTENSION	Pre HTN 120-139/80-89	Lifestyle	Elevated 120-129/< 80	Lifestyle	High NL 130-139/85-89	Lifestyle
	Stage 1 140-159/90-99	Lifestyle and Medications to keep BP < 140/90	Stage 1 130-139/80-89	Lifestyle for all. Medications to keep BP < 130/80 if ASCVD, ASCVD risk, DM or CKD	Grade 1 140-159/90-99	Lifestyle for all. Medications to keep BP < 140/90 if under 75 yo
	Stage 2 ≥ 160/≥ 100	Lifestyle and Medications to keep BP < 140/90	Stage 2 ≥ 140/90	Lifestyle and Medications to keep BP < 140/90	Grade 2 160-179/100-109	Lifestyle and Medications to keep BP < 140/90 if < 75 yo; and SBP < 160 for 75-80 yo

- ***When choosing a BP target for a particular patient,** take into account patient characteristics, such as age and any existing co-morbidities (such as DM, heart disease, kidney disease, etc.) and **document the patient's BP target**. Population management goals are not individual goals, for which patients' unique medical scenario and the weighing of risks and benefits must be taken into account. (See pages 2 and 6)

ASSESSMENT:

- **History:** Complete history including pertinent symptom review for cardiovascular disease (CVD) or TOD, medication use (including over-the-counter [OTC] and herbals), illicit drug use history, personal or family history of cardiac disease, HTN, DM, cerebrovascular accident (CVA), CKD, peripheral vascular disease (PVD), or other coronary heart disease (CHD) equivalent. Age of onset is also important.
- **Calculate ASCVD Risk Level:** Document CV risk based pooled cohort equation http://www.cvriskcalculator.com/ (See page 4)
- **Physical Exam:** Accurate BP measurements (See page 2) in both arms (use higher reading), heart and lung exam, palpation of pulses, assessment for carotid, abdominal, femoral bruits, thyroid palpation, abdominal exam for masses, organomegaly, pulsatile aorta, extremities for edema and pulses, and neurologic exam. Funduscopic examination is best completed in eye clinic. (See page 4)
- **Initial Diagnostic Evaluation:** ECG, UA, blood glucose and hematocrit, serum potassium, creatinine/GFR, calcium, lipid profile. Consider secondary causes of HTN and test for these if clinically indicated. (See page 5)

TREATMENT

- **Education:** Regarding diet, reducing sedentary time, increasing aerobic exercise, maintaining weight or weight loss (if BMI > 25), smoking avoidance, importance of HTN management, and the importance of adherence with therapy.
- **Therapeutic lifestyle changes:** Diet: ↓ daily intake of sodium, ↑ exercise (e.g., brisk walking at least 30 min/day most days of week), limiting alcohol consumption, and weight loss if needed.
- **Medication:** Choose based on comorbid clinical conditions and patient preference (See pages 7-20).
  - Initial drug therapy: Typically a diuretic, angiotensin converting enzyme inhibitor (ACEI) or calcium channel blocker (CCB). (See table page 7)
  - Initiate therapy with two medications if BP ≥ 160/100 at diagnosis, or if goal is lowering BP > 20mmHg/10mmHg. Two or more medications are often required to achieve BP goal.
  - Diuretics should usually be included in any regimen of three or more drugs.
  - If BP not controlled with 3 meds, evaluate adherence, consider secondary HTN. May need a specialist.

MONITORING

Follow-up visits: Frequency will depend on HTN Stage and control, as clinically indicated, but at least every 365 days. Check BP at every visit. In general, the patient should be seen by a primary care team member at least Q 1 month until controlled.

- BP checks can be performed as nurse visits, but the provider must review and act as clinically indicated.

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HYPERTENSION TREATMENT ALGORITHM

Patient presents with Hypertension. Perform comprehensive assessment including the following:

- **Complete History and Physical Exam, confirm diagnosis**
- Make note of any Cardiovascular Risk Factors present: (older age (M > 55, F > 65), African-American race, dyslipidemia, HTN, DM, smoking, Also: CKD-microalbuminuria or est. GFR < 60 ml/min, family history of premature CVD (M < 55, F < 65), overt ASCVD, BMI ≥ 30 kg/m^2, and physical inactivity)
- **Labs,** focus on **TOD** (left ventricular hypertrophy, angina/myocardial infarction (MI)/coronary artery disease (MI)/stent or coronary artery bypass graft (CABG), stroke/transient ischemic attack, CKD, PVD, retinopathy), alerts for secondary HTN, and degree of BP elevation
- **Special Considerations: Frail, elderly, history of labile BP with hypotension, > 3 BP meds, ↓ life expectancy, comorbid conditions: shared decision-making with patient for Customized Treatment Threshold**

Alerts for Secondary HTN? (See page 5)

Pre-HTN BP: **120-129/80-89**

Encourage healthy living and recommend lifestyle changes if appropriate (See page 6) (Evidence Class 1)

Recheck in 1 year

Primary HTN Confirmed
(At least 2 BPs from each of at least 2 visits)

Hypertensive urgency or emergency > 180/> 120 (See Algorithm on next page)

Set Treatment BP Goal (See page 6)

- Start Medications for Age <60, DM without ASCVD and DM without CKD if CV risk < 10% if **BP ≥ 140/≥ 90±**
- Start Medications for Age > 60, No ASCVD, No DM, No CKD if **BP ≥ 150/≥ 90**
- Start Medications for those with ASCVD, CKD with albuminuria ≥ 30 mg/24hr or CV risk > 10%, if **BP ≥ 130/≥ 80**
- **Recommend Therapeutic Lifestyle Changes** (Evidence Class 1)
- Patient Education: ↓ salt intake, ↑ exercise, limit alcohol, ↓ BMI (lose weight)
- Consider Dietary Consult and Nursing HTN Education Consult

First Line Medication: (Evidence Class 1)

- Start with Thiazide or ACEI/ARB or CCB or
- **Medication Choices by Condition** (See page 7)
- If BP > 20mmHg/10mmHg over goal, recommend initiate 2 medications (See page 7)

Recheck in 1 Month

- If not at goal, add second agent from the list on page 7 (preferred), or ↑ dose of first medication

Recheck in 1 Month

- If not at goal, consider different medication or continue dose ↑ , or
- Add a third agent from list on page 7, if tolerated, and
- Consider adherence issues: make medication NA/DOT for a time

RTC at least Q 1 month until goal met

- If consistently not at goal on at least 2 medications, re-evaluate for secondary causes and consider referral to a Nephrologist

When BP Goal Reached:

- **PCP Re-assess 3-6 months** (Evidence Class 1)
- Nurse BP checks* q 1 mo if CV Risk Factors present
- Nurse BP checks q 3 mos* if no CV Risk Factors present
- If baseline ASCVD risk < 10%: Re-assess CV Risk q 1 year for patients with DM and at least every 4-6 years if baseline is > 5% for at-risk non-DM or after clinical changes/defining clinical event *(2013 ACC and 2018 UTD)*

***Nursing alerts:**

- **Not at target:** progress note to the PCP
- **For BP > 160/100:** discuss with the PCP at huddle or co-consult
- **For BP > 180/120: Transfer to TTA/ER**

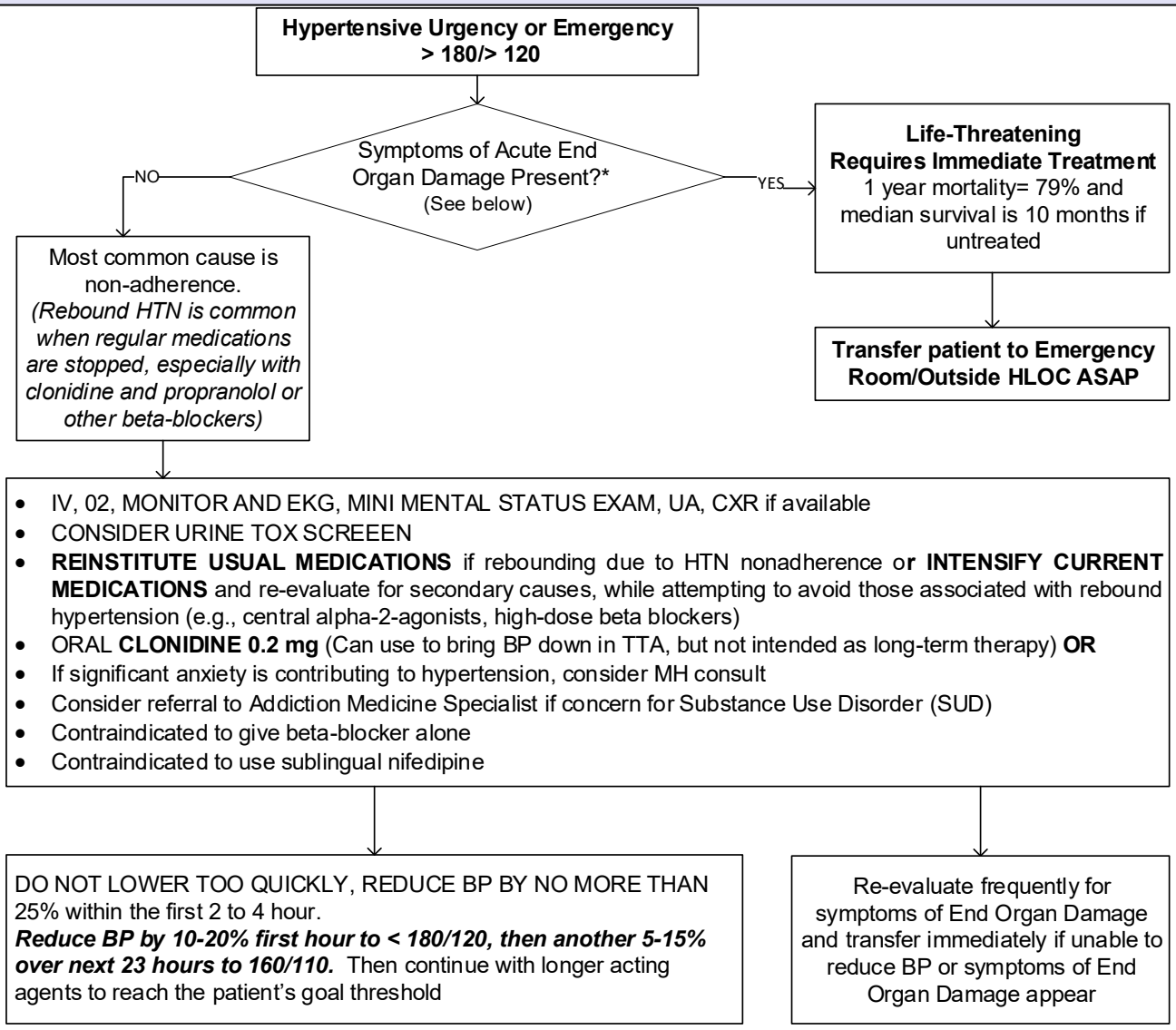
ACC/AHA Class of Evidence [Class 1 = Strong]
Algorithm adapted from JNC 8 2014 and AHA/ACC 2017

2013 ACC Reference: Goff, ACC.AHA Guideline on the Assessment of Cardiovascular Risk, 10/1016/j.jacc.2013.11.005

±Note:

- JNC 8 does not change goal or pathway for the presence of ASCVD or Cardiac Risk Factor Assessment ≥ 10%
- **2019 Up to Date, and 2012 KDIGO (proteinuric), 2018 ADA, 2018 Kaiser Permanente, and 2017 ACC/AHA all** recommend the BP treatment goal of **< 130/80** for **patients with ASCVD or ASCVD risk > 10%**

HYPERTENSIVE URGENCY OR EMERGENCY TREATMENT ALGORITHM



*** SIGNS AND SYMPTOMS OF TARGET END ORGAN DAMAGE**

Symptoms	End Organ Damage	Signs
CNS changes/nausea/ vomiting	Brain injury/encephalopathy/ hemorrhagic CVA	↓ Glasgow Coma Score, ↑ intracranial pressure, CVA presentation
Visual disturbance	Retinal injury	Papilledema, flash flame hemorrhages, exudates/cotton wool spots
Chest pain/upper thoracic discomfort/ripping sensation	Myocardial infarction/Aortic dissection	Positive ACS biomarkers, abnormal EKG, BP differential between the two arms/TEE or CT for dissection
Dyspnea	Pulmonary Edema	Fluid overload, pedal edema, X-ray findings
Hematuria	Acute hypertensive nephrosclerosis	Red blood cells in urinary sediment
Fetal distress/maternal swelling/headache	Pregnancy induced HTN	Fetal distress on monitor, pedal edema, ↑ urination, proteinuria

ASSESSMENT

History

- Personal history of high BPs
- Risk Factors for essential HTN – See Table on right
- History of PVD, DM, CKD
- History of end organ damage: MI, angina, post CABG
- Medications: Prescribed, OTC, and illicit /alcohol intake
  - -NIDA substance use questionnaire (See CCHCS Care Guide Pain Management Part 1: Attachment B)
- Family history of HTN
- History alerts for Secondary HTN (See page 5)
- **Assess CV Risk**: (http://www.cvriskcalculator.com/)
- **CV Risk Calculator parameters:** Age, African-American race, total cholesterol, HDL, systolic BP, diastolic BP, medical BP treatment, DM, smoking

Risk Factors for Developing Primary HTN

Can be Controlled	Cannot be Controlled
• Overweight or obese • Sedentary lifestyle/lack of physical activity • High sodium diet (> 3 gm/day) • ↑ alcohol consumption	• Age • Race: (African-Americans: ↑ severity, earlier / ↑ end organ damage) • Family history • ↓ number of nephrons

Physical Exam

- Vital Signs: Take BP both arms (average them): See Taking a Proper BP section below
  - Note: > 15 mmHg differential between the upper extremities could be subclavian steal or PVD
  - Tachycardia (Consider thyroid/SUD: cocaine/methamphetamine)
  - Bradycardia (Consider hypothyroidism)
  - Assess Body Mass Index (BMI) - Obesity BMI auto calculates in the electronic health record system (EHRS) after you enter the patient's height and weight. Ensure weight is converted to kg prior to entering it in EHRS.
- HEENT: Funduscopic exam – recommended but best performed by ophthalmologist or optometrist
- Vascular: Bruits/jugular venous pulsations/pedal edema/pulses, pulsatile abdominal mass
- Evidence of TOD: Left ventricular hypertrophy, heart failure, PVD, retinopathy, evidence of prior stroke, CAD/MI/CABG
- Physical alerts for Secondary HTN (See page 5)

Labs (especially for evidence of secondary cause of HTN)

- **UA**- Abnormal (non-infectious) urinalysis especially proteinuria
- **CBC**- Evidence of anemia (can be suggestive of renal disease)
- **Basic Metabolic Panel**- Look for eGFR for evidence of CKD and for low K+ (with paradoxical urinary wasting- High **Urine K+** and metabolic alkalosis) which may represent primary aldosteronism, metabolic acidosis may be indicative of pruno binging, or CKD
- **Calcium**– Look for hypercalcemia (hyperparathyroidism is associated with refractory HTN)
- **Fasting Lipid Panel**- Contributes to CV risk
- **TSH**
- **ECG** (baseline)- Look for evidence or prior MI or left ventricular hypertrophy
- **Urinary Albumin to Creatinine Ratio/eGFR** especially in patients with DM and CKD

Taking a Proper BP Measurement

- Use of an automated ocillometric BP (calibrated or validated) machine is recommended.
- If using a sphygmomanometer, inflate to at least 30 mmHg above point where radial pulse disappears; rate of deflation should be 2 mmHg/second or slower for patients with bradycardia to obtain an accurate reading.
- Remove all clothing covering the location of cuff placement.
- The patient should be seated with arms/back supported & feet on floor (no exam table).
- The patient should rest for at least 5 minutes prior and cease talking.
- Appropriate cuff size should be used (bladder within the cuff should encircle 80% of arm or more). **If rested BP is lower, record lower in chart.**
- The patient's arm should be supported and arm muscles relaxed with cuff at level of right atrium.
- The cuff should be pulled taut with comparable tightness at top and bottom edges off cuff. 1 finger should fit easily at top and bottom of cuff; 2 fingers should fit but will be snug.
- Initial diagnosis/taking BP both arms: Take higher reading of at least 2 BPs on ≥ 2 visits and average them.
- Space readings 1-2 minutes apart.

Ask the patient:
- Drinking caffeinated beverages?
- Recent (30 minutes) nicotine?
- Recent (30 minutes) exercise?
- In pain?
- Bladder empty?
- If/when took BP meds today?

SECONDARY CAUSES OF HYPERTENSION

Identifiable Causes of Secondary Hypertension

GENERAL CONSIDERATIONS	CLINICAL FEATURES	EVALUATION FOR THE CAUSE
When to Consider Secondary Causes of HTN	***FIRST CONFIRM MEDICAL REGIMEN ADHERENCE*** • **Severe (> 180/110) HTN** • **Resistant HTN (BP not at goal despite concurrent use of 3 antihypertensive agents of different classes, one of which should be diuretic)** • **An acute rise in BP over a previously stable value** • **Proven age of onset before puberty** • **Age < 30 yrs with no HTN family history or obesity**	**As indicated based on history**
Drug induced/related **SUD** *(See section below)*	• Taking a medication associated with elevating BP	Trial off drug, if possible
Acute and Chronic Kidney Disease	• Poorly controlled BP, edema, fatigue, frequent urination anemia, abnormal urinalysis	Serum creatinine, GFR, renal US
Renovascular Disease *Older patient: ASCVD* *Younger patient: Fibromuscular Dysplasia*	• An acute elevation in serum creatinine after administration of ACEI or ARB • Moderate-severe HTN in a patient with diffuse atherosclerosis or a unilateral small kidney • Repeated episodes of flash pulmonary edema • Systolic-diastolic bruit (not very sensitive)	Screen only if a corrective procedure would be considered for the patient. Most invasive interventions are reserved for fibromuscular dysplasia. • Magnetic resonance angiography • CT angiography • Duplex Doppler ultrasonography **Only order on recommendation of Nephrologist** • Renal arteriogram gold standard but is an invasive test.
Sleep Apnea	• Primarily seen in obese men who snore loudly while asleep • Daytime somnolence, fatigue, and morning confusion	Sleep study
Primary Aldosteronism (Mineralocorticoid EXCESS)	• Triad: HTN, unexplained Hypo K^+, and metabolic alkalosis; muscle weakness and cramps • Hypokalemia* with urinary potassium wasting *Note: more than 1/2 of patients are normokalemic	Ratio of plasma aldosterone to plasma renin activity
Thyroid Disease / Primary Hyperparathyroidism	• Symptoms of hypothyroidism (bradycardia, dry skin, weight gain, cold intolerance) or hyperthyroidism (tachycardia, weight loss, palpitations, heat intolerance) • History of kidney stones < 20 yo	TSH, serum calcium, parathyroid hormone levels
Cushing's Syndrome (rare) or Steroid Therapy	• Cushingoid facies, central obesity, proximal muscle weakness, and ecchymoses	Dexamethasone-suppression test
Pheochromocytoma (rare)	• Paroxysmal elevations in blood pressure • Dizziness • Triad of headache, palpitations, and sweating	24-hour urine catecholamines and metanephrines
Coarctation of the aorta or history of repair	• HTN in the arms with diminished or delayed femoral pulses and low or unobtainable blood pressures in the legs. Rib notching noted on chest X-ray	Doppler or CT imaging of aorta

Common Drugs that Cause Hypertension

- NSAIDS
- Decongestants: phenylephrine/pseudoephedrine
- Tricyclics; Serotonin and Norepinephrine Reuptake Inhibitors (SNRIs), (venlafaxime and duloxetine), and Monoamine Oxidase Inhibitors (MAOIs)
- Sodium bicarbonate antacids
- Methamphetamine, cocaine
- Corticosteroids
- Clozapine, olanzapine
- Erythropoietin
- Oral birth control pills, estrogen

TREATMENT GOALS

When choosing BP treatment goal for an individual patient, the provider should take into account the patient's age, presence of co-morbidities such as CVD (or ASCVD risk), DM or CKD, and the patient's overall health and medical frailty.

- **Shared decision-making** is encouraged when setting BP targets, especially in older patients who may experience serious side effects with attempts at tight BP control with multiple medications.
- When determining the patient's HTN stage, use the higher stage of either systolic BP value or diastolic BP value.

Blood Pressure Treatment Targets:

- Significant scientific differences of opinion and interpretation of HTN target BP goals exist. Varying treatment goals for HTN are noted below.
- In general, the **JNC8 guidelines remain the recommendations for most CCHCS patients without ASCVD**. While the ACP and AAFP and others generally support JNC8 treatment goals, newer evidence supports tighter BP control is indicated in patients with established ASCVD, or ASCVD risk > 10%, and CKD. CCHCS' recommended BP targets are indicated in the table below with a check mark.

Blood Pressure Treatment Goals ✓ CCHCS Endorsed

Scientific Body	JNC 8-2014	ACP/AAFP	ACC/AHA-2017	European 2018
General population ≤59 years old	**< 140/< 90** ✓	140/90	< 140/< 90	< 140/< 90
General population ≥60 years old	< 150/< 90 Use best judgment	**150/90 Shared decision-making**	**<140/<90** ✓ **Shared decision-making**	< 140/< 90
ASCVD or CVD risk ≥10% with or without DM		*Consider < 140/90 based on individualized assessment for ↑ CV risk CV risk = ASCVD, most with DM, CKD, <45 mL/min/1.73m^2, metabolic syndrome and older age	**< 130/< 80** ✓	
DM	< 140/< 90 ✓		**< 130/< 80**	
CKD	< 140/< 90		**< 130/< 80** ✓	

PATIENT EDUCATION

- Explain to patients the importance of knowing how their BP levels compare to normal and what steps they need to take to help reach their BP goal.
- Review therapeutic lifestyle modifications (See section below).
- Patient empowerment: Explain relationship of HTN to ASCVD and importance of overall attention to ASCVD risk factors.
- Write out a "Know Your Numbers" sheet (See Patient Education PE-2) with goals for weight, activity, DM control, lipid control, and BP control.
- Discuss importance of taking medications, and encourage the patients to be open with their primary care team if they have concerns or side effects that may cause them to be non-adherent.

TREATMENT: THERAPEUTIC LIFESTYLE INTERVENTIONS

The following Therapeutic Lifestyle Interventions are proven to be effective in lowering blood pressure.

- Dietary Salt Restriction: Decrease to 2000 to 2300 milligrams/day* or at least start by lowering by 1 gram/day
- Diet: Dietary Approaches to Stop Hypertension (DASH) eating plan:
  - -Eat more fruits, vegetables, fish, poultry, nuts, unsaturated fats, and low fat dairy
  - -Limit intake of: red meat, sweets, sugary drinks, saturated fats, and total fats
- Exercise: at least 150 minutes (2 hours and 30 minutes) of aerobic activity of moderate or greater intensity per week and 2 days of muscle-strengthening activity
  - -Consider recommending 30 minutes of activity at least 5 days a week, providing examples to the patients (i.e., brisk walking, jogging, push-ups, sit-ups, body-weight squats)
- Lose Weight: Linear relationship–lowering of weight generally lowers BP, roughly 1 mmHg for every pound lost
- Reduce alcohol intake (when in the community): Max: 2 drinks/day for men, 1 drink/day for women
- K+ supplementation: 3.5-5.0 grams/day by diet (contraindicated in CKD and K+ retaining medications)
- Stop smoking and stop using illicit drugs

*2012 KDIGO and 2013 World Health Organization: <2000 mg/day; 2015 US Dietary Guidelines (US Department Agriculture and Health and Human Services <2300 mg/day; 2010 AHA <1500mg/day

TREATMENT: MEDICATION CHOICES—BY CONDITION

ANTIHYPERTENSIVE MEDICATION RECOMMENDATIONS BASED ON CLINICAL FEATURES

Degree of BP lowering more important than which agent

IDENTIFIED UNDERLYING CONDITION (CI)	1st Line Therapy Monotherapy	2nd Line Therapy* Dual Therapy	3rd Line Therapy Triple Therapy	4th Line Therapy
NONE **Non African-American patients,** **DM without microalbuminuria**	ACEI/ARB, CCB, Thiazide diuretic *AHA recommends two agents for Stage 2 HTN or ≥ 20/10 mmHg over goal	ACEI/ARB, CCB, Thiazide diuretic Add second agent from fist line preferred over higher does of monotherapy (especially for systolic BP ≥ 20/10 mmHg from goal) Higher doses of first choice in monotherapy an option for mild HTN and medically straightforward cases	ACEI/ARB, CCB, Thiazide diuretic Thiazide or spironolactone should be part of a triple regimen After one dose increase of the dual therapy agents, add third agent from first line preferred over continued higher doses of dual therapy	Beta-blocker Vasodilator Alpha-blocker
African-American patients **NONE or with DM**	Diuretic CCB Thiazide	Higher doses or combinations Thiazide diuretic, CCB		
Diabetes with Microalbuminuria	ACEI/ARB, CCB	Higher doses or combinations ACEI/ARB, CCB, Thiazide diuretic		
Heart Failure with Low Ejection Fraction or CAD	Beta-blocker	Diuretic with ACEI	Aldosterone inhibitor, ARB	
Post MI	Non sympathomimetic beta-blocker (metoprolol, carvedilol, or atenolol) and ACEI	Aldosterone inhibitor (spironolactone)		
CKD complicated by Proteinuria	ACEI/ARB	Diuretic		
Atrial Fibrillation with Need for Rate Control	Dihydropyrimadole (diltiazem or verapamil) or beta-blocker	ACEI/ARB Thiazide diuretic		

Additional Medication Notes:

- If the goal BP is not reached within a month of treatment, adding a second drug is usually needed and preferred over increasing doses of the initial drug. Choose from one of the recommended classes and recheck after 1 month.
- Do not use an ACEI and ARB together.
- Avoid use of CCB with beta-blocker.
- The choice of antihypertensive agents in some patients is guided by concomitant conditions and their treatment.

TREATMENT: MEDICATION CHOICES—BY MEDICATION CLASS

Additional Considerations for Antihypertensive Drug Selection			
Drug Class	**Conditions with Potentially FAVORABLE Effects**	**Conditions with Potentially UNFAVORABLE Effects**	**Conditions to AVOID Use**
ACEIs	• Elevated fasting glucose • Microalbuminuria • Low-normal potassium	• Hyperkalemia (or high-normal potassium) • Renovascular disease	• Bilateral renal artery stenosis • History of angioedema • Pregnancy • Lithium use
ARBs	• Elevated fasting glucose • Microalbuminuria • Low-normal potassium	• Hyperkalemia (or high-normal potassium) • Renovascular disease	• Bilateral renal artery stenosis • Pregnancy • Lithium use
Dihydropyridine CCBs (amlodipine and nifedipine XL)	• Elderly patients with isolated systolic HTN • Cyclosporine-induced HTN • Raynaud's phenomenon • Angina	• Left ventricular dysfunction (except amlodipine and felodipine) • Peripheral edema • Tachycardia (or high-normal heart rate)	• Severe left ventricular dysfunction (except amlodipine and felodipine)
Nondihydropyridine CCBs (diltiazem and verapamil)	• Migraines • Tachycardia (or high-normal heart rate) • Supraventricular arrhythmias/Atrial Fib or flutter • Raynaud's phenomenon • Angina	• Low-normal heart rate • Peripheral edema	• Left ventricular dysfunction • 2nd or 3rd degree AV block
Thiazide-like and Thiazide-type diuretics	• Osteoporosis • High-normal potassium	• Elevated fasting glucose • Gout • Hyponatremia (or low-normal sodium) • Hypokalemia or (low-normal potassium)	• Anuria • Kidney failure • Lithium use
Alpha Blocker	• Benign prostatic hyperplasia		
Non-Cardioselective Beta-Blocker (propranolol)	• Essential tremor • Migraine		
Beta-Blocker	• Hyperthyroidism • Migraine • Angina	• Depression • Bradycardia • Uncontrolled hypothyroidism	• Bronchospasm/asthma • 2nd or 3rd degree AV block
Aldo Agonist (spironolactone)	• Low normal potassium	• Hyperkalemia (or high normal potassium)	

TREATMENT: MEDICATIONS ON CCHCS FORMULARY

CCHCS FORMULARY ANTIHYPERTENSIVES

Class	Drug	Usual Dose	Frequency	Comments
			Primary Agents	
DIURETICS Thiazide-like/ Thiazide-type	Hydrochlorothiazide (HCTZ)	12.5-50 mg/day	QD	• Monitor for hyponatremia and hypokalemia, uric acid and calcium levels, especially if given with a loop (metolazone) • Use with caution in patients with history of acute gout unless the patient is on uric acid-lowering therapy, or low-normal K+ • May cause elevated fasting glucose • Avoid in patients with kidney failure and anuria, osteoporosis, and/or Lithium use
	Metolazone	2.5-5.0 mg/day	QD	
ACE INHIBITORS (ACEI)	Enalapril	5-40 mg/day	QD or divided BID	• Favorable in: elevated fasting glucose, microalbuminuria, CKD and low-normal K+ • Do not use in combination with ARBs or direct renin inhibitor • Increased risk of hyperkalemia (or high-normal potassium), especially in patients with CKD or in those on K+ supplements or K+ sparing drugs • May cause acute renal failure in patients with severe bilateral renal artery stenosis or cause acute paradoxical HTN in renovascular disease • Do not use if history of angioedema with ACEI • Avoid in pregnancy • Avoid in Lithium use • Possible link to increased lung cancer. *Hicks, BMJ 2018;363k4209 Cohort.*
	Lisinopril	10-40 mg/day	QD	
ANGIOTENSIN RECEPTOR BLOCKERS (ARB)	Losartan *(reserved for patients intolerant to ACEI)*	25-100 mg/day	QD or divided BID	• Favorable in: elevated fasting glucose, microalbuminuria, CKD and low-normal K+ • Do not use in combination with ACEIs or direct renin inhibitor • Increased risk of hyperkalemia in CKD or pts on K+ supplements/K+ sparing drugs • May cause acute renal failure in patients with severe bilateral renal artery stenosis • Do not use if history of angioedema with ARBs. Patients with a history of angioedema with an ACEI can receive an ARB beginning 6 weeks after ACEI discontinued • Avoid in pregnancy • Avoid in Lithium use
CALCIUM CHANNEL BLOCKERS (CCB) Dihydropyridines	Amlodipine	2.5-10 mg/day	QD	• Favorable in: elderly patients with isolated systolic HTN, cyclosporine-induced HTN, Raynaud's phenomenon, angina • Avoid use in patients with heart failure with reduced ejection fraction; amlodipine or felodipine may be used if required • Associated with dose-related pedal edema, which is more common in women than men • Likely unfavorable effect in tachycardia
	Felodipine	2.5-10 mg PO	QD	
	Nifedipine	30-60 mg/day	QD	
CALCIUM CHANNEL BLOCKERS (CCB) Non-Dihydropyridines	Diltiazem	180-420 mg/day	QD	• Favorable in: migraines, tachycardia (or high-normal heart rate), supraventricular arrhythmias/atrial fib or flutter, Raynaud's phenomenon, angina • Avoid routine use with beta-blockers due to increased risk of bradycardia & heart block • Do not use in patients with heart failure with reduced ejection fraction • Drug interactions with diltiazem and verapamil (CYP3A4 major substrate and moderate inhibitor) • Avoid in 2nd or 3rd degree AV block
	Verapamil	80-320 mg/day	QD or divided BID	
			Secondary Agents	
DIURETICS Loop	Furosemide	20-80 mg/day	Divided BID	• Preferred diuretic in patients with symptomatic heart failure • Preferred over thiazides in patients with moderate-to-severe CKD (e.g., GFR < 30 mL/min)
	Bumetanide	0.5-2.0 mg/day	QD	
DIURETICS Potassium-sparing	Triamterene/HCTZ	37.5-75 mg/day	QD	• Monotherapy agents minimally effective antihypertensive • Combination therapy of potassium sparing diuretic with a thiazide can be considered in patients with hypokalemia on thiazide monotherapy • Avoid in patients with significant CKD (e.g., GFR < 45 mL/min)

TREATMENT: MEDICATIONS ON FORMULARY CONTINUED

CCHCS FORMULARY ANTIHYPERTENSIVES (Continued)

Class	Drug	Usual Dose	Frequency	Comments
DIURETICS-ALDOSTERONE RECEPTOR BLOCKER	Spironolactone	25-50 mg/day	QD	• Favorable in: low-normal potassium • Preferred agents in primary aldosteronism and resistant HTN • Spironolactone associated with greater risk of gynecomastia and impotence compared to eplerenone • Common add-on therapy in resistant HTN • Avoid use with K+ supplements, K+ sparing diuretics or significant renal dysfunction • Eplerenone often requires twice daily dosing for adequate BP lowering • Monitor for hyperkalemia
BETA BLOCKERS Selective β1	Atenolol	25-100 mg/day	QD	• Favorable in: CHF with low EF (except metoprolol tartarate) • Beta blockers are not recommended as first-line agents unless the patient has ischemic heart disease or heart failure • Selective β1 beta-blockers preferred in patients with bronchospastic airway disease requiring a beta blocker, monitor closely • Bisoprolol and metoprolol succinate preferred in patients with heart failure with reduced ejection fraction (HFrEF) • Avoid abrupt cessation • Avoid in second or 3rd degree heart block • Potentially unfavorable effects in depression, bradycardia, and uncontrolled hypothyroidism
	Metoprolol succinate	25-200 mg/day	QD	
	Metoprolol tartrate	50-100 mg/day	QD	
BETA BLOCKERS Nonselective	Propranolol	60-160 mg/ day	QD	• Favorable in: essential tremor and migraine • Avoid in patients with reactive airways disease • Avoid abrupt cessation • Avoid in 2nd or 3rd degree heart block • Potentially unfavorable effects in depression, bradycardia, and uncontrolled hypothyroidism
BETA BLOCKERS Nonselective β/ Selective α1	Carvedilol	6.25-25 mg/day	BID	• Favorable in: CHF with reduced EF, hyperthyroidism, migraine, anxiety, and angina • Carvedilol preferred in patients with HFrEF • Avoid abrupt cessation • Monitor asthmatics closely • Avoid in 2nd or 3rd degree heart block • Potentially unfavorable effects in depression, bradycardia, and uncontrolled hypothyroidism
	Labetalol	200-800 mg/day	BID	
ALPHA BLOCKERS	Doxazosin	1-16 mg/day	QD	• Associated with orthostatic hypotension, especially in older adults • May consider as second-line agent in patients with concomitant benign prostatic hyperplasia (BPH)
	Terazosin	1-20 mg/day	QD or divided BID	
ALPHA AGONISTS	Clonidine	0.1 mg/day	BID	• Favorable in: BPH • Generally reserved as last-line due to significant central nervous system side effects, especially in older adults; significantly sedating • Avoid abrupt discontinuation of clonidine, which may induce hypertensive crisis; clonidine must be tapered to avoid rebound HTN
VASODILATORS	Hydralazine	25-100 mg/day	Divided BID	• Associated with sodium and water retention and reflex tachycardia; use with a diuretic and beta-blocker • Hydralazine associated with drug-induced lupus-like syndrome at higher doses • Minoxidil associated with hirsutism and requires a loop diuretic. Can induce pericardial effusion; need to monitor weight due to salt/water retention; should be reserved for most resistant cases of high blood pressure
	Minoxidil	2.5-80 mg/day	QD or divided BID	

MEDICATIONS: PRIMARY AGENTS

DRUG CLASS / MEDICATION	DOSING	ADVERSE EFFECTS / INTERACTIONS*	COMMENTS
DIURETICS-THIAZIDE-LIKE AND THIAZIDE-TYPE			
Chlorthalidone Tablet: 25 mg, 50mg, 100 mg $$	Initial: 25 mg PO once daily , as the common 12.5 mg initial is confounded by unscored tablets Usual dose: 12.5-25 mg PO once daily Max dose: 100 mg/day (25 mg/day in the elderly) Renal impairment: CrCL ≥ 10 mL/min: No adjustment necessary (UpToDate) CrCL < 10 ml/min: Avoid use Hepatic impairment: Use with caution since minor alterations of fluid and electrolyte balance may precipitate hepatic coma	• Adverse reactions: nausea, dizziness, photosensitivity, rash, hyperuricemia, hyperglycemia, hypokalemia, electrolyte imbalance, anorexia, orthostatic hypotension, arrhythmias, pancreatitis, jaundice, anaphylaxis • Drug interactions: NSAIDS, MAOI, antiglycemics, dofetilide lithium, sotalol, digoxin, flecainide, aminolevulinic acid topical	• Contraindications: anuria, hypersensitivity to chlorthalidone or sulfonamides** • Use caution in patients with asthma, diabetes, gout, hepatic or renal impairment, hypercalcemia, hypercholesterolemia, hypokalemia, SLE, history of pancreatitis, arrhythmia, and hyponatremia • May be more effective in lowering SBP over a 24 hour period than HCTZ
Hydrochlorothiazide [HCTZ] (Micozide®) **Capsule/Tablet: 12.5 mg** **Tablet: 25 mg, 50 mg** **$**	Initial: 12.5-25 mg PO once daily Usual dose: 12.5-50 mg once daily Max dose: 50 mg/day Renal impairment: CrCL < 30 ml/min: Do not use, generally not effective Hepatic impairment: Use with caution since minor alterations of fluid and electrolyte balance may precipitate hepatic coma	• Adverse reactions: hypokalemia (may be severe), hyperglycemia, glycosuria, hyperuricemia, hypercalcemia, electrolyte imbalance, hypotension, dizziness, renal impairment, impotence, photosensitivity, hypersensitivity reactions and rashes, headache, muscle cramps, arrhythmia, weakness, pancreatitis, choleostatic jaundice, diarrhea, nausea, anorexia, Stevens-Johnson syndrome, erythema multiforme and serious dermatolgic conditions, necrotizing angiitis, hemotologic abnormalities, glaucoma secondary angle closure, acute renal insufficiency and failure, SLE exacerbation • Drug interactions: dofetilide (contraindicated), NSAIDS, MAOI, sotalol, digoxin, methotrexate, flecainide, aminolevulinic acid topical, lithium	• Contraindications: anuria, hypersensitivity to hydrochlorothiazide or sulfonamides**, breastfeeding (dose > 50 mg/day) • Use caution in the elderly, patients with diabetes, hepatic or renal impairment, hypercalcemia, hypokalemia and other electrolyte abnormalities, seizure disorder, arrhythmias, volume depletion, hypercholesterolemia, parathyroid disease, SLE, history of gout, history of pancreatitis, post-sympathectomy
Metolazone **Tablet: 2.5 mg, 5 mg, 10 mg** **$$$**	Initial: 2.5-5 mg PO once daily Usual dose: 2.5-5 mg daily Max: 5mg/day Renal impairment: No adjustment needed, if severe, caution advised Hepatic impairment: Use with caution since minor alterations of fluid and electrolyte balance may precipitate hepatic coma	• Adverse reactions: orthostatic hypotension, syncope, hyperuricemia, hypercalcemia, hypokalemia, electrolyte imbalance, muscle cramps, acute renal insufficiency, anorexia, headache, diarrhea or constipation, hyperglycemia, dizziness, fatigue, hypersensitivity reactions, blood dyscrasias, hepatitis, photosensitivity, rash and pruritis, choleostatic jaundice, arrhythmias, pancreatitis, Stevens-Johnson syndrome and serious dermatologic conditions, erythema multiforme, necrotizing angiitis, SLE exacerbation, • Drug interactions: lithium, aminolevulinic acid topical, dofetilide, NSAIDS, MAOI, sotalol, digoxin, flecainide	• Contraindications: anuria, hypersensitivity to metolazone, hepatic coma or pre-coma • Use with caution in patients with sulfonamide hypersensitivity • Use caution in the elderly, patients with diabetes, gout, hepatic or renal impairment, volume depletion, arrhythmias, hypokalemia, SLE, sensitivity to sulfonamides, history of pancreatitis, post-sympathectomy, seizures

Bold = Formulary *See prescribing information for complete description of dosing, adverse effects and drug interactions.

The cost scale $-$$$$$ represents the relative cost of acquisition of medication only. Frequency and complexity of medication administration (institution workload, effect on adherence) should be considered when determining overall cost-effectiveness of treatment.

**Sulfonamide ("sulfa") allergy: The FDA-approved product labeling for many medications containing a sulfonamide chemical group includes a broad contraindication in patients with a prior allergic reaction to sulfonamides. Although thiazide diuretics are sulfonamide derivatives, sulfonamide cross-sensitivity has been rarely documented. Until further data are available, thiazide diuretics should be used with caution in patients with sulfonamide hypersensitivity. Thiazide diuretics do not contain the N4-aromatic amine or the N1-substituent which are present in sulfonamide antibiotics. Non-arylamine sulfonamide derivatives, such as thiazide diuretics, have been proposed to have a lower risk of allergic reactions in patients with sulfonamide allergy, presumably due to lack of an arylamine group at the N4 position (a proposed structural site of action for sulfonamide allergy).

MEDICATIONS: PRIMARY AGENTS (CONTINUED)

DRUG CLASS / MEDICATION	DOSING	ADVERSE EFFECTS / INTERACTIONS*	COMMENTS
RENIN-ANGIOTENSION SYSTEM INHIBITORS • **Black Box Warning**: Fetal toxicity, pregnancy category D. When pregnancy is detected, discontinue ACEI as soon as possible. Drugs that act directly on the renin-angiotensin system can cause injury and death to the developing fetus. • Do not use ACEIs and ARBs together • Less antihypertensive effects in African-Americans than non-African-Americans			
ANGIOTENSIN-CONVERTING ENZYME INHIBITORS (ACEI)			
Enalapril (Vasotec®) **Tablet: 2.5 mg, 5mg, 10 mg, 20 mg** **$**	Initial: 5 mg PO once daily; 2.5 mg PO once daily if on diuretic, hypovolemia, hyponatremia, moderate-severe CHF Usual dose: 5-40 mg/day in 1-2 divided doses Max: 40 mg/day Renal impairment: CrCl ≤ 30 ml/min: Initial dose 2.5 mg once daily HD: 2.5 mg after dialysis, on dialysis days	• Adverse effects: dizziness, hypotension, headache, fatigue, cough, hyperkalemia, photosensitivity, hyperuricemia, Stevens-Johnson syndrome, head/neck/intestinal angioedema, hepatotoxicity, pancreatitis, increased BUN and Scr • Drug interactions: potassium-sparing diuretics, potassium supplements, hypoglycemic agents, NSAIDS, ARBs, aliskiren, lithium, azathioprine, allopurinol, pregabalin, trimethoprim, sacubitril	• Contraindications: pregnancy, idiopathic or hereditary angioedema; angioedema related to treatment with ACEI, hypersensitivity to enalapril or an ACEI, concomitant use with aliskiren in patients with diabetes, concomitant use with sacubitril • Use caution in patients with renal artery stenosis, moderate-severe renal impairment, severe CHF, elderly, African-American, volume depletion, hyponatremia, hypotension, aortic stenosis, hypertrophic cardiomyopathy, CAD, cerebrovascular disease aortic stenosis, cerebrovascular disease, collagen vascular disease • Monitor renal function and potassium levels
Lisinopril (Prinivil®, Zestril®) **Tablet: 2.5 mg, 5 mg, 10 mg, 20 mg, 40 mg** **$**	Initial: 10 mg PO once daily; 5 mg PO once daily if on diuretic Usual dose: 10-40 mg once daily Max dose: 80 mg/day Renal impairment: CrCl 10-30ml/min: Initial dose 5 mg once daily; max 40 mg/day CrCl < 10 ml/min or HD: Initial dose 2.5 mg once daily; max 40 mg/day	• Adverse effects: dizziness, hypotension, syncope, headache, URI, cough, fatigue, abdominal pain, photosensitivity, hyperuricemia, head/neck/ intestinal angioedema, hyperkalemia, pancreatitis, increased BUN and Scr • Drug interactions: potassium-sparing diuretics, potassium supplements, hypoglycemic agents, NSAIDS, ARBs, aliskiren, lithium, azathioprine, allopurinol, pregabalin, trimethoprim, sacubitril	• Contraindications: pregnancy, idiopathic or hereditary angioedema; angioedema related to treatment with ACEI, hypersensitivity to Lisinopril or an ACEI, concomitant use with aliskiren in patients with diabetes, concomitant use with sacubitril • Use caution in patients with aortic stenosis, CVA, hypertrophic cardiomyopathy, ischemic heart disease, renal impairment, renal artery stenosis, collagen vascular disease, cerebrovascular disease, elderly, African-American • Monitor renal function and potassium levels
ANGIOTENSIN RECEPTOR BLOCKERS (ARB) ARBs are as effective as ACEI in hypertension with fewer adverse effects but cost significantly more			
Candesartan (Atacand®) Tablet: 4 mg, 8 mg, 16 mg, 32 mg $$$-$$$$	Initial: 16 mg PO once daily; 8 mg PO once daily if on diuretic Usual dose: 8-32 mg/day in 1-2 divided doses Max dose: 32 mg/day CHF Class II-IV: Initial dose: 4 mg/day, increase q 2 weeks Renal impairment: Mild-moderate: 8 mg/day Severe/HD: ≤ 8 mg/day Hepatic impairment: Moderate: Initial dose 8 mg/day; Severe: not studied	• Adverse effects: angioedema, severe hypotension (especially CHF patients), headache, dizziness, hyperkalemia, back pain, pharyngitis, rhinitis, upper respiratory infection, changes in renal function, acute renal insufficiency and failure, rhabdomyolysis, hepatitis, leuko and neutropenia, elevated hepatic enzymes • Drug interactions: NSAIDs, lithium, potassium-sparing diuretics, ACEI, aliskiren (contraindicated in patients with diabetes), MAOIs, potassium supplements, eplerenone, digoxin, clofarabine, lofexidine	• Contraindications: hypersensitivity to ARBs, pregnancy, concomitant use with aliskiren in patients with diabetes • Use caution in patients with heart failure, hepatic or renal impairment or renal artery stenosis • Monitor renal function and potassium levels • Unlike ACEIs, ARBs are much less likely to cause cough • Less antihypertensive effects in African-American than non-African-American
Losartan (Cozaar®) **Tablet: 25 mg, 50 mg, 100 mg** **$**	Initial: 50 mg PO once daily; 25 mg PO once daily if on diuretic; increase dose weekly if needed Usual dose: 25-100 mg/day in 1-2 divided doses Max dose: 100 mg/day CHF with reduced EF: Initial dose: 25-50mg Renal impairment: no adjustment needed; in volume depleted patients initial dose: 25mg/day Hepatic impairment: Initial dose: 25 mg/day	• Adverse effects: angioedema, anaphylaxis, severe hypotension (especially CHF patients), headache, nausea, dizziness, pharyngitis, diarrhea, myalgia, insomnia, fatigue, sinusitis, hyperkalemia, hepatitis, acute renal insufficiency and failure, cough, musculoskeletal pain, chest pain, asthenia, URI symptoms, dyspepsia, rhabdomyolysis • Drug interactions: NSAIDs, lithium, potassium-sparing diuretics, ACEIs, aliskiren (contraindicated in patients with diabetes), MAOIs, potassium supplements, eplerenone, digoxin, rifampin, fluconazole, phenobarbital, clofarabine, lofexidine	• Contraindications: hypersensitivity to ARBs, pregnancy, concomitant use with aliskiren in patients with diabetes • Use caution in patients with heart failure, hepatic impairment, renal artery stenosis, hyperkalemia, hyponatremia, hypovolemia • Monitor renal function and potassium levels • Unlike ACEIs, ARBs are much less likely to cause cough • Less antihypertensive effects in African-American than non-African-American • **Recommended use criteria**: Documented failure or intolerance to ACEI or for patients already controlled on ARB

MEDICATIONS: PRIMARY AGENTS (CONTINUED)

DRUG CLASS / MEDICATION	DOSING	ADVERSE EFFECTS / INTERACTIONS*	COMMENTS
CALCIUM CHANNEL BLOCKERS (CCB)			
DIHYDROPYRIDINES: Higher incidence of peripheral edema than non-dihydropyridines			
Amlodipine (Norvasc®) **Tablet: 2.5 mg, 5 mg, 10 mg** **$**	Initial: 5 mg PO once daily; 2.5 mg PO once daily if small, fragile, or elderly patient; increase dose after 7-14 days if needed Usual dose: 2.5-10 mg once daily Max dose: 10 mg/day Renal impairment: no adjustment needed Hepatic impairment: initial dose 2.5 mg/day	• Adverse effects: peripheral edema, fatigue, abdominal pain, nausea, somnolence, headache, flushing, dyspnea, palpitations, dizziness, reflex tachycardia, gingival hyperplasia, hypotension-may be acute, nausea, eczema (especially in chronic use or the elderly), urticaria, rash, pruritus • Increased angina and/or MI has occurred with initiation or dosage titration, hepatitis, hypersensitivity reactions and erythema multiforme • Drug interactions: codeine, methadone, oxycodone, hydrocodone, simvastatin, cyclosporine, tacrolimus, sildenafil, carbamazepine, phenytoin, rifamycins, MAOIs, azole antifungals, macrolide antibiotics, protease inhibitors, dantroline, diltiazem and verapamil, St. John's Wort, primidone, lofexidine • Food Interaction: grapefruit juice. Monitor closely with concurrent use	• Contraindications: hypersensitivity to amlodipine or other dihydropyridines • Use with caution in the elderly, CHF, patients with severe aortic stenosis, severe obstructive coronary disease, severe hepatic impairment • NOTE: Cisapride has been withdrawn from the market and is only available by an investigational limited access program for patients meeting strict inclusion criteria
Felodipine (Plendil®) **Tablet (ER): 2.5 mg, 5 mg, 10 mg** **$$**	Initial: 5 mg PO once daily; **2.5 mg PO once daily in elderly;** increase dose after 14 days if needed Usual dose: 2.5-10 mg once daily Max dose: 10 mg/day Renal impairment: no adjustment needed Hepatic impairment: initial dose 2.5 mg/day	• Adverse effects: peripheral edema, headache, asthenia, palpitations, dizziness, somnolence, flushing, dyspepsia, reflex tachycardia, gingival hyperplasia, hypotension-may be severe, reflex tachycardia, eczema (especially in chronic use or the elderly) • Increased angina and/or MI has occurred with initiation or dosage titration • Drug interactions: cyclosporine, tacrolimus, carbamazepine, phenytoin, phenobarbital, rifamycins, MAOIs, azole antifungals, macrolide antibiotics, protease inhibitors, primidone, lofexidine • Food Interaction: grapefruit. Do not eat grapefruit or drink grapefruit juice while taking this medication	• Contraindications: hypersensitivity to felodipine or other dihydropyridines • Use with caution in the elderly, patients with severe aortic stenosis, hepatic impairment, heart failure or compromised ventricular function
Nifedipine (Adalat CC®, Procardia XL®) **Tablet (XL): 30 mg, 60 mg, 90 mg** Tablet (CC): 30 mg, 60 mg, 90 mg **$-$$**	Initial: 30 mg PO once daily; increase dose after 7-14 days if needed Usual dose: 30-60 mg once daily Max dose: 120 mg/day (XL) 90 mg/day (CC) CC: Take on an empty stomach; 1 hour before or 2-3 hours after eating Renal impairment: no adjustment needed Hepatic impairment: not studied, use caution Do not cut, crush or chew Taper dose to D/C	• Adverse effects: peripheral edema, CHF, palpitations and arrhythmia, pulmonary edema, flushing, reflex tachycardia, nausea, dizziness, headache, nervousness, hypotension, fatigue/ weakness, elevated liver enzymes, GI obstruction/ulcers (XL form), cholestasis, Steven-Johnson syndrome, muscle cramps, dyspnea, nasal congestion, gingival overgrowth, eczema (especially in chronic use or the elderly) • Increased angina and/or MI has occurred with initiation or dosage titration • Drug interactions: cyclosporine, tacrolimus, digoxin, clopidogrel, lacosamide, carbamazepine, phenytoin, phenobarbital, rifamycins, MAOIs, azole antifungals, macrolide antibiotics, protease inhibitors, flecainide, nafcillin, rifampin, verapamil, St. John's Wort, lofexidine, dantrolene, secobarbital, butalbital, butabarbital, primidone • Food Interaction: grapefruit. Do not eat grapefruit or drink grapefruit juice while taking this medication	• Contraindications: hypersensitivity to nifedipine or other dihydropyridines, galactose intolerance, and IR formulations contraindicated to manage hypertensive crisis and essential HTN • Use with caution in heart failure or severe aortic stenosis, severe left ventricular dysfunction, renal impairment, severe hepatic impairment, hypertrophic cardiomyopathy, concomitant therapy with β-blocker or digoxin, edema, or recent D/C of β-blocker • Avoid ER /XL tabs in patients with stricture/ narrowing of GI tract, or GI hypomotility

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MEDICATIONS: PRIMARY AGENTS (CONTINUED)

DRUG CLASS / MEDICATION	DOSING	ADVERSE EFFECTS / INTERACTIONS*	COMMENTS
CALCIUM CHANNEL BLOCKERS (CCB)			
NON-DIHYDROPYRIDINES • Cause less vasodilation and more cardiac depression than dihydropyridine CCBs; can cause reductions in heart rate & contractility			
Diltiazem (Cardizem, Cardizem CD®, Dilt CD) **Tablet (IR): 60 mg, 90 mg** **Capsule (ER-24hr): 120 mg, 180 mg, 240 mg, 300 mg**, 360 mg (NF) **$-$$**	Initial (ER-24h): 180-240 mg PO once daily, adjust after 14 days Usual dose (ER-24h): 240-360mg once daily Max dose: 480mg/day Renal impairment: no adjustment needed Hepatic impairment: Consider using lower doses ER cap/tab: Swallow whole. Do not cut, crush, chew or dissolve	• Adverse effects: headache, constipation, peripheral edema, fatigue, rhinitis, pharyngitis, dyspepsia, myalgia, dizziness, asthenia, heart block, rash, bradycardia, arrhythmias, syncope, elevated liver enzymes, acute liver injury, hypotension-may be severe, CHF, serious dermatologic conditions, gingival hyperplasia • Drug interactions: flobanserin, eliglustat, lomotapide, simvastatin, lovastatin, atorvastatin, β-blockers, digoxin, amiodarone, lithium, buspirone, carbamazepine, rifampin, phenobarbital, butalbital, butabarbital, pentobarbital, codeine, morphine, fentanyl, hydrocodone, buprenorphine, meperidine, tramadol, methadone, lofexidine, cyclosporine, tacrolimus, theophylline, clonidine, dantrolene, verapamil, felodipine, ergotamine, primidone, colchicine, phenytoin, ranolazine, erythromycin, clarithromycin, MAOIs, antiarrhythmics, protease inhibitors, azole antifungals, amlodipine, flecainide, guanfacine, nafcillin, St. John's Wort, clopidogrel, lurasidone, thioridazine	• Contraindications: hypersensitivity to diltiazem, sick sinus syndrome (without pacemaker); 2nd or 3rd degree AV block; severe hypotension (SBP < 90), acute MI and pulmonary congestion, afib/flutter associated with accessory bypass tract (IVform), V-Tach (IV form), concomitant use of colchicine, flibanserin, lomitapide, eliglustat • Avoid use in patients with heart failure and reduced ejection fraction, cardiac conduction defects • Use caution in left ventricular dysfunction, hepatic or renal dysfunction • IR tablets not FDA approved for HTN
Verapamil (Calan®, Calan-SR®, Isoptin SR®) **Tablet (IR): 40mg, 80mg, 120 mg** **Tablet (ER-12hr): 120 mg, 180 mg, 240 mg** **$$-$$$**	**IR:** Initial: 80 mg PO 3 times daily. Elderly/small stature initial: 40 mg TID Usual dose: 120-360 mg/day in 3 divided doses **ER(12 hr):** Initial: 180 mg PO once daily in morning Titration: may increase dose at weekly intervals to 240 mg once daily, then 180 mg twice daily (or 240 mg in the morning and 120 mg in the evening), up to 240 mg twice daily Elderly/small stature initial: 120 mg/day Usual dose: 120-480 mg/day in 1-2 divided doses Max dose: 480 mg/day, however, no evidence of additional benefit with doses above 360 mg/day Renal impairment: Use lowest start dose Hepatic impairment: Consider not using ER, reduce initial dose by 1/3, Severe insufficiency: Use 30% of the normal dose (70% dose reduction) ER cap/tab: Swallow whole. Do not cut, crush, chew or dissolve	• Adverse effects: constipation, dizziness, gingival hyperplasia, nausea, headache, edema, fatigue, bradycardia– may be severe, heart block, heart failure, hepatic toxicity/ elevated liver enzymes, hypotension– may be severe, paralytic ileus, pharangitis, sinusitis, influenza-like symptoms • Drug interactions: simvastatin, lovastatin, atorvastatin, β-blockers including ophthalmic, digoxin, lithium, quinidine, carbamazepine, rifampin, phenobarbital, cyclosporine, theophylline, clonidine, colchicine, dantrolene, dabigatran, phenytoin, ranolazine, erythromycin, clarithromycin, MAOIs, amiodarone, antiarrhythmics, protease inhibitors, azole antifungals, amlodipine, felodipine, buspirone, codeine, hydrocodone, oxycodone, fentanyl, morphine, buprenorphine, meperidine, methadone, tramadol, triazolam, midazolam, lofexidine, dantrolene, dihydroergotamine, primidone, secobarbital, propaphenone, butalbital, dihydroergotamine, guanfacine, St. John's Wort, tacrolimus, clopidogrel, thioridazine	• Contraindications: hypersensitivity to verapamil, severe left ventricular dysfunction; sick sinus syndrome; 2nd or 3rd degree AV block; severe hypotension (SBP < 90); cardiogenic shock; patients with atrial flutter or atrial fibrillation and an accessory bypass tract (e.g., Wolff-Parkinson White, Lown-Ganong Levine syndromes), concomitant use of fibanserin, lomitapide, colchicine, eliglustat and dofetilide • Use caution in the elderly, patients with hepatic or renal impairment, decreased neuromuscular transmission (myasthenia gravis, muscular dystrophy), IHSS (idiopathic hypertrophic subaortic stenosis), bradycardia, CHF, GERD • Monitor for PR interval prolongation in renal impairment

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MEDICATIONS: SECONDARY AGENTS

DRUG CLASS / MEDICATION	DOSING	ADVERSE EFFECTS / INTERACTIONS*	COMMENTS
LOOP DIURETICS More effective than thiazides in lowering BP in patients with moderate to severe renal insufficiency (CrCl < 30 ml/min)			
Furosemide (Lasix®) **Tablet: 20 mg, 40 mg** **INJ: 10 mg/ml** **$**	Initial: 20-40 mg PO twice daily Usual dose: 20-80 mg/day divided in 2 doses Max: 600 mg/day Renal or hepatic impairment: No adjustment needed, caution advised for cirrhosis/ascites	• Adverse reactions: hyperuricemia, hypercalcemia, hypokalemia, hypomagnesemia, electrolyte imbalance, metabolic alkalosis, muscle cramps, hyperglycemia, loss of appetite, nausea/vomiting, pruritis, blurred vision, abdominal cramps, diarrhea, bladder spasm, polyuria and urinary frequency, tinnitus and hearing loss, dizziness, hypersensitivity reactions, anaphylaxis, cholesterol and triglycerides increased, elevated liver enzymes, photosensitivity, blood dyscrasias, hypovolemia, acute renal insufficiency and failure, rash/severe dermatologic conditions, pancreatitis and choleostatic jaundice, vasculitis, SLE exacerbation, nephrolithiasis (chronic use), thrombosis, paresthesias • Drug interactions: desmopressin, aminoglycosides, ethacrynic acid, lithium, cisplatin, ARBs, ACEIs, sucralfate, chloral hydrate, phenytoin, ritonavir, cephalosporins, cyclosporine, NSAIDs, MAOIs, amikacin, lofexidine, probenecid, neomycin, foscarnet, clofarabine	• **Black Box Warning**: If given in excessive amounts, furosemide can lead to profound dieresis resulting in fluid & electrolyte depletion • Contraindications: anuria, hypersensitivity to furosemide, hepatic coma, electrolyte imbalances, concomitant use of desmopressin • Use caution in the elderly, in cirrhosis, diabetes, prostatic hyperplasia/urinary stricture/urinary retention, SLE, concomitant ototoxic drugs (e.g., aminoglycosides, ethacrynic acid), sensitivity to sulfonamides, arrhythmias, iodinated contrast dye, hepatic and renal disease
POTASSIUM SPARING DIURETICS			
Triamterene/HCTZ (Dyazide®, Maxzide®) **Capsule: 37.5/25 mg** **Tablet:** 37.5/25 mg, **75/50 mg** **$**	Initial: 37.5/25 mg PO once daily Usual dose: 37.5/25 mg to 75/50 mg once daily Max dose: 75/50 mg/day Renal impairment: AVOID CrCl < 30 ml/min: Do not use (contraindicated) Hepatic impairment: Use with caution since minor alterations of fluid and electrolyte balance may precipitate hepatic coma	• Adverse reactions: hyperkalemia, shortness of breath, orthostatic hypotension, dizziness, electrolyte imbalance, muscle cramps, anorexia, nausea/vomiting, taste changes, impotence, blurred vision, hyperglycemia, hepatic coma, acute renal failure, angle-closure glaucoma, drowsiness and fatigue, tachycardia, kidney stones, hypercalcemia, hyperuricemia, hypercholesterolemia, hypersensitivity reactions, photosensitivity, anaphylaxis, arrhythmias, pancreatitis, intrahepatic choleostatic jaundice, severe dermatologic conditions, hematologic abnormalities, SLE exacerbation, DM, headache, asthenia • Drug interactions: lithium, dofetilide, amiloride, spironolactone, eplerenone, digoxin, NSAIDs, trimethoprim, ACEIs, ARBs, MAOIs, lofexidine, chlorfarabine, aminovulinic acid topical, methotrexate, desmopressin, cyclosporin	• **Black Box Warning**: Abnormal elevation of serum potassium levels (≥ 5.5 mEq/L) can occur. Risk of hyperkalemia is increased in patients with renal dysfunction, diabetes (with or without renal impairment), the elderly, and severely ill. Since uncorrected hyperkalemia may be fatal, serum potassium levels must be monitored at frequent intervals especially upon initiation, when dosages are changed or with any illness that may influence renal function • Contraindications: hypersensitivity to triamterene or hydrochlorothiazide, pregnancy, breastfeeding hyperkalemia, antikaliuretic therapy or potassium supplementation, anuria, acute or chronic renal insufficiency, severe renal impairment, hypersensitivity to sulfonamides**, concomitant use of amilioride, dofetilide, eplerenone, potassium bicarbonate, additional triamterene, and spironolactone • Use caution in patients with diabetes, hepatic or renal impairment, hypercalcemia, hypercholestolemia, kidney stones, parathyroid disease, SLE, seizures, volume depletion, arrhythmias, gout, hx of pancreatitis, post-sympathectomy, electrolyte abnormalities, concurrent use of lithium

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**Sulfonamide ("sulfa") allergy: The FDA-approved product labeling for many medications containing a sulfonamide chemical group includes a broad contraindication in patients with a prior allergic reaction to sulfonamides. Although thiazide diuretics are sulfonamide derivatives, sulfonamide cross-sensitivity has been rarely documented. Until further data are available, thiazide diuretics should be used with caution in patients with sulfonamide hypersensitivity. Thiazide diuretics do not contain the N4-aromatic amine or the N1-substituent which are present in sulfonamide antibiotics. Non-arylamine sulfonamide derivatives, such as thiazide diuretics, have been proposed to have a lower risk of allergic reactions in patients with sulfonamide allergy, presumably due to lack of an arylamine group at the N4 position (a proposed structural site of action for sulfonamide allergy).

MEDICATIONS: SECONDARY AGENTS (CONTINUED)

DRUG CLASS / MEDICATION	DOSING	ADVERSE EFFECTS / INTERACTIONS*	COMMENTS
ALDOSTERONE RECEPTOR BLOCKER			
Spironolactone (Aldactone®) **Tablet: 25 mg, 50 mg, 100 mg** **$-$$**	Initial: 25-100 mg/day PO in 1-2 divided doses; may increase dose after 2 weeks Renal impairment/CHF start: 12.5 mg/every other day or daily Usual Dose: 25-50 mg once daily Max dose: Doses > 100 mg/day generally do not provide additional reductions in blood pressure Renal impairment: CrCl 39-49 ml/min: extend dosing interval to every 12-24 hours CrCl < 30 ml/min: avoid use Hepatic impairment: Per mfg. labeling—Initiate in the hospital	• Adverse reactions: gynecomastia, breast pain, diarrhea, fever, nausea, vomiting, GI bleeding, gastritis, gastric ulcer, somnolence, hyperkalemia-may be severe, hyperuricemia, electrolyte imbalance, metabolic acidosis, gout, lethargy, muscle cramps, headache, abdominal cramps, confusion, dizziness, gastritis, blood dyscrasias/agranulocytosis, rash, hypersensitivity reactions, anaphylaxis, vasculitis, renal failure, hepatotoxicity, Stevens-Johnson syndrome, severe dermatologic conditions, SLE, irregular menses, erectile dysfunction • Drug interactions: triamterene, eplerenone (contraindicated), ACEIs, ARBs, heparin, lithium, corticosteroids, NSAIDs, digoxin, trimethoprim, MAOIs, amikacin, lofexidine, chlofarabine, warfarin	• **Black Box Warning:** Shown to be a tumorigen in chronic toxicity animal studies. Avoid unnecessary use • Contraindications: anuria, acute renal insufficiency, CrCl < 30 if over 65 years old, Addison's disease, hyperkalemia, concomitant eplerenone, amiloride, and/or triamterene use, significant renal impairment • Use caution in patients with cirrhosis, heart failure, renal impairment, adrenal vein catherization, volume depletion, diabetes, hepatic impairment, gout • May be a useful adjunct in patients with resistant hypertension • Minimal effect on lowering blood pressure, but used in combination with thiazides to minimize potassium loss
BETA-BLOCKERS • **Black Box Warning:** Abrupt discontinuation of any beta-adrenergic blocking agent, particularly in patients with preexisting cardiac disease, can cause myocardial ischemia, myocardial infarction, ventricular arrhythmias, or severe hypertension • When discontinuing therapy, beta-blockers should be gradually stopped to avoid rebound hypertension (decrease dose by 50% for 3 days and then another 50% for 3 days)			
CARDIOSELECTIVE BETA-1 ANTAGONISTS			
Atenolol (Tenormin®) **Tablet: 25 mg, 50 mg, 100 mg** **$**	Initial: 25-50 mg PO once daily; if inadequate response after 1 to 2 weeks, may increase to 100 mg PO once daily Usual dose: 25-100 mg once daily Max dose: 100 mg/day Renal impairment: CrCl 15 to 35 mL/min: Max dose 50 mg/day CrCl < 15 mL/min: Max dose 25 mg/day	• Adverse reactions: bradycardia, dizziness, fatigue, depression, nightmares, diarrhea, impotence, cold extremities, hypotension, fatigue, heart failure, chest pain, heart block, edema, nausea, vertigo, abnormal lipids, supraventricular tachycardia, dyspnea • Drug interactions: amiodarone, dronedarone, verapamil, diltiazem, clonidine, NSAIDS, digoxin, reserpine, disopyramide, MAOIs, anti-diabetic agents, α-blockers	• Contraindications: sinus bradycardia, 2nd or 3rd degree heart block, uncompensated heart failure, cardiogenic shock, overt cardiac failure, hypersensitivity to atenolol or any component of the product • Use caution in patients with renal impairment, bronchospastic disease, conduction abnormality, diabetes, heart failure, myasthenia gravis, pheochromocytoma, PVD, thyroid disease, anesthesia and major surgery, elderly, avoid abrupt withdrawal, pregnancy and lactation • May mask symptoms of hypoglycemia
Metoprolol Succinate (Toprol-XL®) Tablet (ER): **25 mg**, 50 mg, 100 mg, 200 mg INJ: 5 mg/15ml $-$$$	Initial: 25-100 mg PO qd, may increase dose q wk Usual dose: 50-200 mg once daily Max dose: 400 mg/day Renal impairment: no adjustment needed, give dose after dialysis Hepatic impairment: start with low doses and titrate gradually	• Adverse reactions: CHF, bradycardia, heart block, fatigue, dizziness, diarrhea, rash, pruritus, depression, sleep disturbances, gangrene, dyspnea, bronchospasm, angina • Drug interactions: celecoxib, ceritinib, clonidine, antidiabetic agents, NSAIDs, verapamil, diltiazem, rifampin, lidocaine, venlafaxine, amiodarone, dronedarone, propafenone, quinidine, fluoxetine, paroxetine, reserpine, MAOIs, α-blockers	• **CCHCS Restricted** to patients who currently have medical justification for half tablet dosing of metoprolol tartrate 25 mg (12.5 mg dose). Prescribing multiple tablets to make up higher doses must be avoided • Contraindications: sinus bradycardia; 2nd or 3rd degree heart block; cardiogenic shock; overt heart failure; sick sinus syndrome (except in patients with a functioning artificial pacemaker); severe peripheral arterial disease, hypersensitivity to metoprolol succinate or any component of the product • Use caution in patients with heart failure, PVD, diabetes, thyroid disorder, hepatic impairment, bronchospastic disease, myasthenia gravis, psoriasis, anesthesia and major surgery, elderly, avoid abrupt withdrawal and pregnancy • May mask symptoms of hypoglycemia

Bold = Formulary

*See prescribing information for complete description of dosing, adverse effects and drug interactions.

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MEDICATIONS: SECONDARY AGENTS (CONTINUED)

DRUG CLASS / MEDICATION	DOSING	ADVERSE EFFECTS / INTERACTIONS*	COMMENTS
BETA-BLOCKERS CONTINUED			
CARDIOSELECTIVE BETA-1 ANTAGONISTS CONTINUED			
Metoprolol Tartrate (Lopressor®) **Tablet (IR): 25mg, 50mg, 100mg** **$-$$$**	**IR:** Initial: 50 mg PO twice daily with food Usual dose: 100-200 mg/day in 2 divided doses with food Max dose: 450 mg/day with food Renal impairment: No adjustment needed, give dose after dialysis Hepatic impairment: Initiate at low dose and titrate dose slowly	• Adverse effects: fatigue, dizziness, diarrhea, pruritus, rash, depression, dyspnea, bradycardia, sleep disturbance, nightmares, heart failure, heart block, gangrene, bronchospasm, photosensitivity • Drug interactions: amiodarone, dronedarone, verapamil, diltiazem, clonidine, digoxin, MAOIs, reserpine, quinidine, fluoxetine, paroxetine, propafenone, antidiabetic agents, NSAIDs, celecoxib, ceritinib, rifampin, lidocaine, venlafaxine, α-blockers	• Contraindications: sinus bradycardia; 2nd or 3rd degree heart block; cardiogenic shock; overt heart failure; sick sinus syndrome (except in patients with a functioning artificial pacemaker); severe peripheral arterial disease, hypersensitivity to metoprolol tartrate or any component of the product • Use caution in patients with hepatic impairment, bronchospastic disease, conduction abnormality, diabetes, heart failure, myasthenia gravis, pheochromocytoma, PVD, psoriasis, psychiatric disease, thyroid disease, history of severe anaphylactic reactions, anesthesia and major surgery, elderly, avoid abrupt withdrawal and pregnancy • May mask symptoms of hypoglycemia
NONSELECTIVE BETA-BLOCKER			
Propranolol (Inderal® LA) **Tablet (IR): 10mg, 20mg, 40mg, 60mg** **$-$$$** **INJ: 1 mg/ml-1 ml** Capsules (ER): 60 mg, 80 mg, 120 mg, 160 mg $$-$$$	**IR:** Initial: 40 mg PO twice daily Usual dose: 120-240 mg/day divided in 2 doses Max dose: 640 mg/day **ER:** Initial: 80 mg PO once daily Usual dose: 120-160 mg once daily Max dose: 640 mg/day Renal or Hepatic impairment: No adjustment needed	• Adverse effects: bradycardia, hypotension, fatigue, vivid dreams, nausea, diarrhea, pruritis, rash, brochospasm, hypersensitivity reactions, impotence, Peyronie's disease, cold extremities, angina, heart block, heart failure, depression • Drug interactions: amiodarone, dronedarone, verapamil, diltiazem, lidocaine, epinephrine, thioridazine, clozapine, fluoxetine, haloperidol, warfarin, digoxin, clonidine, antidiabetic agents, NSAIDs, MAOIs, α-blockers	• Contraindications: blood pressure < 50/30 mmHg, HR < 80 beats/min, decompensated heart failure, cardiogenic shock; sinus bradycardia, sick sinus syndrome, or heart block greater than 1st degree (except in patients with a functioning artificial pacemaker); bronchial asthma; pheochromocytoma, hypersensitivity to propranolol or any component of the product, concurrent use with thioridazine • Use caution in patients with hepatic or renal impairment, bronchospastic disease, conduction abnormality, diabetes, heart failure, myasthenia gravis, PVD, psoriasis, psychiatric disease, thyroid disease, elderly, avoid abrupt withdrawal and pregnancy • May mask symptoms of hypoglycemia

Bold = Formulary

*See prescribing information for complete description of dosing, adverse effects and drug interactions.

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MEDICATIONS: SECONDARY AGENTS (CONTINUED)

DRUG CLASS / MEDICATION	DOSING	ADVERSE EFFECTS / INTERACTIONS*	COMMENTS
NONSELECTIVE BETA-BLOCKER/SELECTIVE ALPHA 1 BLOCKER • **Black Box Warning:** Abrupt discontinuation of any beta-adrenergic blocking agent, particularly in patients with preexisting cardiac disease, can cause myocardial ischemia, myocardial infarction, ventricular arrhythmias, or severe hypertension • When discontinuing therapy, beta blockers should be gradually stopped to avoid rebound hypertension (decrease dose by 50% for 3 days and then another 50% for 3 days)			
Carvedilol (Coreg®) **Tablet (IR): 3.125 mg, 6.25 mg, 12.5 mg, 25 mg** **$**	Initial: 6.25 mg PO twice daily with food; may increase to 12.5 mg PO twice daily after 7-14 days if needed Usual dose: 6.25-25 mg twice daily with food Max dose: 25 mg twice daily with food Renal impairment: No adjustment needed Hepatic impairment: Severe: Contraindicated	• Adverse effects: dizziness, fatigue, hypotension, diarrhea, hyperglycemia, asthenia, bradycardia, weight increase, vomiting, nausea, arthralgia, visual disturbances, edema, syncope, angina, anemia, pulmonary edema, elevated hepatic enzymes, CHF, asthma, increased cough, dyspnea, erectile dysfunction, depression • Intraoperative floppy iris syndrome has been reported during cataract surgery • Drug interactions: rifampin, MAOIs, clonidine, cyclosporine, digoxin, amiodarone, verapamil, diltiazem, antidiabetic agents, quinidine, fluoxetine, paroxetine, propafenone, reserpine, NSAIDs, epinephrine, dronedarone, α1-blockers	• Contraindications: patients with severe bradycardia (except in patients with a functioning artificial pacemaker), 2nd or 3rd degree AV block, decompensated heart failure, requiring IV inotropic therapy, sick sinus syndrome, cardiogenic shock, bronchial asthma, severe hepatic impairment, hypersensitivity to carvedilol or any component of the product • Use caution in patients with PVD, Prinzmetal angina, bradycardia, bronchospastic disease, heart failure, major surgery, diabetes, thyroid disorder, WPW syndrome, psoriasis, pheochromocytoma, renal impairment, hepatic impairment, myasthenia gravis, elderly, avoid abrupt withdrawal, pregnancy and lactation • May mask symptoms of hypoglycemia
Labetalol **Tablet: 100mg, 200mg, 300mg** **$-$$$$**	Initial: 100 mg PO twice daily; increase in increments of 100 mg PO twice daily every 2-3 days if needed Usual dose: 200-400 mg twice daily; 100-200 mg twice a day in elderly Max dose: 2400mg/day in 2-3 divided doses Renal impairment: No adjustment needed Hepatic impairment: Reduce dose by 50%	• Adverse effects: heart failure, hyperkalemia, hepatotoxicity, bronchospasm, hypotension, nausea, dizziness, headache, fatigue, nasal congestion, dyspnea, erectile dysfunction, psoriasis • Intraoperative floppy iris syndrome has been reported during cataract surgery • Drug interactions: amiodarone, verapamil, diltiazem, clonidine, dronedarone, halothane, cimetidine, digoxin, antidiabetic agents, nitroglycerin, MAOIs, NSAIDs, imipramine, epinephrine, α-blockers	• Contraindications: severe bradycardia; heart block > 1st degree (except in patients with a functioning artificial pacemaker); cardiogenic shock; bronchial asthma; uncompensated cardiac failure; conditions associated with severe and prolonged hypotension, hypersensitivity to labetalol or any component of the product • Use caution in patients with bronchospastic disease, conduction abnormality, diabetes, heart failure, hepatic impairment, myasthenia gravis, PVD, pheochromocytoma, psoriasis, psychiatric disease, thyroid disease, latent cardiac insufficiency, elderly, pregnancy avoid abrupt withdrawal • May mask symptoms of hypoglycemia

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MEDICATIONS: SECONDARY AGENTS (CONTINUED)

DRUG CLASS / MEDICATION	DOSING	ADVERSE EFFECTS / INTERACTIONS*	COMMENTS
ALPHA-1 ADRENERGIC-BLOCKERS			
Doxazosin (Cardura®) **Tablet: 1mg, 2 mg, 4 mg, 8 mg** **$-$$$**	Initial: 1 mg PO once daily at bedtime; increase dose every 1-2 weeks if needed Usual dose: 1-16 mg once daily Max dose: 16 mg/day Renal impairment: no adjustment needed Hepatic impairment: Mild-moderate: use caution Severe: Avoid use	• Adverse effects: dizziness, headache, fatigue/malaise, somnolence, edema, rhinitis, dyspnea, palpitations, chest pain, nausea, diarrhea, xerostomia, blurred vision, polyuria, arrhythmias • May cause significant orthostatic hypotension and syncope, especially with first dose • Intraoperative floppy iris syndrome may occur during cataract surgery • Priapism has been associated with use (rare) • Drug interactions: PDE-5 inhibitors (e.g., sildenafil, tadalafil, vardenafil), MAOIs, verapamil, nifedipine, tamsulosin, β-blockers, midodrine	• Contraindications: hypersensitivity to doxazosin, any other component of the product, or other quinazolines (e.g., prazosin, terazosin) • Use caution in patients with heart failure, angina pectoris, or recent acute MI (within the last 6 months) hepatic disease, elderly, hypotension, cataract surgery, pregnancy and breastfeeding • Discontinue if angina occurs or worsens
Terazosin **Capsule: 1 mg, 2 mg, 5mg, 10 mg** **$**	Initial: 1 mg PO once daily at bedtime; increase dose gradually over several weeks if needed Usual dose: 1-5 mg/day may divide doses BID Max dose: 20 mg/day Use with concomitant medications: When adding a diuretic or other antihypertensive, decrease terazosin dose and re-titrate Discontinuation or interruption of therapy for several days or longer, restart use at the initial dose Renal impairment: no adjustment needed Hepatic Impairment: No specific recommendations available	• Adverse effects: dizziness, headache, asthenia, nasal congestion, peripheral edema, somnolence, nausea, pain, dyspnea, paresthesia, sinusitis, nervousness, tachycardia, palpitations, atrial fibrillation, anaphylaxis • May cause significant orthostatic hypotension and syncope, especially with first dose • Intraoperative floppy iris syndrome may occur during cataract surgery • Priapism has been associated with use (rare) • Drug interactions: PDE-5 inhibitors (e.g., sildenafil, tadalafil, vardenafil), MAOIs, β-blockers, verapamil, nifedipine, midodrine	• Contraindications: hypersensitivity to terazosin, any other component of the product, or other quinazolines (e.g., doxazosin, prazosin) • Use caution in the following patients: elderly, heart failure, angina, pregnant or breastfeeding, hypotension, cataract surgery • Discontinue if angina occurs or worsens • Risk of syncope greatest during initial week of treatment, but risk continues throughout

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MEDICATIONS: SECONDARY AGENTS (CONTINUED)

DRUG CLASS / MEDICATION	DOSING	ADVERSE EFFECTS / INTERACTIONS*	COMMENTS
CENTRAL ALPHA-2 ADRENERGIC AGONIST			
Clonidine (Catapres®, Catapres TTS®) **Tablet: 0.1 mg, 0.2 mg, 0.3 mg** Patch: 0.1 mg/24 h, 0.2 mg/24 h, 0.3 mg/24 h **$ - Tablets** $$$-$$$$$ - Patches	**Tablets** Initial: 0.1mg PO twice daily; increase by 0.1mg/day at weekly intervals until desired effect achieved; consider lower start dose in elderly patients Usual dose: 0.2-0.8 mg/day in 2 divided doses Max dose: 2.4 mg/day **Patch** Initial: Apply 0.1 mg/24 h patch to upper arm or torso once every 7 days; increase by 0.1 mg/24 h patch increments every 1-2 weeks as needed Max dose: 0.6 mg/24 h every 7 days Renal impairment: Use lower initial dose Hepatic Impairment: Clonidine is substantially metabolized by the liver, monitor patients for sedation and hypotension and adjust the dose if necessary	• Adverse effects: somnolence, headache, hypotension, orthostatic hypotension, increased body temperature, xerostomia, abdominal pain, fatigue, nightmares, nausea, URI, irritability, throat pain, insomnia, confusion, dizziness, sedation, constipation, diarrhea, sexual dysfunction, syncope, bradycardia, AV block, nasal congestion, urinary incontinence • Drug interactions: TCAs, digoxin, diltiazem, verapamil, β-blockers, MAOIs, mirtazapine, CNS depressants, cyclosporine, naloxone	• **Black Box Warning:** Appropriate Use: dilute 500 mcg/mL strength product prior to use in an appropriate solution. Obstetrical, Postpartum, or Perioperative Use: weigh risk/benefit; epidural clonidine generally not recommended for obstetrical, postpartum, or perioperative pain management due to risk of hemodynamic instability, especially hypotension and bradycardia • Contraindications: hypersensitivity to clonidine or any other component of the product; epidural administration in patients receiving anticoagulant therapy, bleeding diathesis, injection site infection or administration above the C4 dermatome • Use caution in patients with recent MI, cerebrovascular disease, chronic renal insufficiency, severe coronary insufficiency, or conduction disturbances, elderly, dehydration, history of depression, alcohol use, pregnancy or lactation • Do not discontinue clonidine abruptly. Reduce dose gradually over 2-4 days to prevent rebound hypertension, nervousness, agitation, and headache • Patients on both β-blocker and clonidine where discontinuation of clonidine is necessary, withdraw the β-blocker several days before gradual discontinuation of clonidine • Oral doses above 1.2 mg/day may not provide additional benefit • Antihypertensive effect of patches may take 2-3 days after initial application • Clonidine is often used for treatment of hypertensive urgencies
Guanfacine **Tablet (IR): 1 mg, 2 mg** **$-$$$**	Initial: 1 mg PO daily at bedtime; increase to 2mg after 3-4 weeks, then 3mg after an additional 3-4 weeks if needed NOTE: Most of the clinical effect will be seen at the 1 mg dose Usual dose: 1-2 mg once daily Max dose: 3 mg/day Renal impairment: CrCl < 30 ml/min: use lower doses Hepatic Impairment: Use with caution, dose adjustment may be necessary	• Adverse effects: xerostomia, somnolence, headache, dizziness, constipation, fatigue, exfoliative dermatitis, syncope, bradycardia • Drug interactions: CNS depressants, phenobarbital, phenytoin, β-blockers, TCAs, mirtazapine, MAOIs	• Contraindications: hypersensitivity to guanfacine or any other component of the product • Use caution in patients with recent MI, cerebrovascular disease, severe coronary insufficiency, history of bradycardia, heart block, hypotension, or syncope, chronic renal or hepatic failure, elderly, CAD, pregnancy or lactation • Abrupt discontinuation of guanfacine may lead to anxiety, nervousness or hypertension. Decrease the dose over several days • Increased adverse effects with doses above 3mg/day

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MEDICATIONS: SECONDARY AGENTS (CONTINUED)

DRUG CLASS / MEDICATION	DOSING	ADVERSE EFFECTS / INTERACTIONS*	COMMENTS
DIRECT VASODILATORS			
Hydralazine **Tablet: 25 mg, 50 mg** **$**	Initial: 10 mg PO 4 times per day for 2-4 days; then increase to 25 mg PO 4 times per day for the remainder of week 1, then may increase to 50 mg 4 times per day Usual dose: 100-200 mg/day in 4 divided doses Max dose: 300 mg/day Renal impairment: CrCl 10-50 mL/min: administer every 8 hours CrCl < 10 ml/min: dosing interval may be extended to 8-16 hours Hepatic Impairment: No specific recommendations available, however, hydralazine undergoes extensive hepatic metabolism.	• Adverse effects: headache, tachycardia, angina, palpitations, nausea, vomiting, diarrhea, MI, hypotension, neutropenia, blood dyscrasias, lupus-like syndrome, peripheral neuropathy, edema, loss of appetite, dizziness, pruritus, rash • Drug interactions: thoridazine, clonidine, lofexidine, MAOIs, NSAIDs, levodopa	• Contraindications: patients with CAD or mitral valve rheumatic heart disease, hypersensitivity to hydralazine or any other component of the product • Use caution in patients with severe renal disease, CVAs, mitral valvular disease, elderly, hypertrophic cardiomyopathy, hypotension, SLE, pregnancy • Incidence of SLE higher in patients on higher doses (> 200 mg/day) • Usually administered with diuretic and β-blocker to counteract sodium and water retention and reflex tachycardia
Minoxidil **Tablet: 2.5 mg, 10 mg** **$-$$$**	Initial: 5 mg/day PO once daily 2.5 mg PO once daily in elderly; increase dose gradually every 3 days Usual dose: 10-40 mg/day in 1-2 divided doses Max dose: 100 mg/day Renal impairment: CrCl 10-50 ml/min: extend dosing interval to 24 hours CrCl < 10ml/min: not recommended Hepatic Impairment: No specific recommendations available, use with caution and titrate gradually	• Adverse effects: tachycardia, angina, marked fluid retention, pericardial effusion, pericarditis, weight gain, headache, edema, tamponade, hair growth on face and body, CHF, Stevens-Johnson syndrome, rash, nausea • Drug interactions: lofexidine, MAOIs, NSAIDs, cyclosporine	• **Black Box Warnings**: Appropriate Use: Administer under close supervision usually in combination with therapeutic doses of beta-blocker to prevent tachycardia and increased myocardial workload; must also usually give with loop diuretic to prevent serious fluid accumulation; hospitalize patients with malignant HTN and if concomitant guanethidine for initial treatment, monitor to avoid too rapid or large orthostatic decrease in blood pressure. Serious Cardiac Event Risk: Powerful antihypertensive with serious adverse event risk including pericardial effusion sometimes progressing to tamponade and angina pectoris exacerbation; reserve for HTN patients without adequate response to max therapeutic dose of diuretic and 2 other antihypertensives • Contraindications: patients with pheochromocytoma, pericardial effusion, hypersensitivity to minoxidil or any other component of the product • Use caution in patients with, renal failure, elderly, cardiac disease, MI, CHF, tachycardia, cerebrovascular disease, pregnancy • Avoid use of minoxidil for 1 month after acute MI • Usually administered with diuretic and β-blocker to counteract sodium and water retention and reflex tachycardia • Minoxidil should be reserved for severe hypertension refractory to other drugs.

Bold = Formulary

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REFERENCES

1. American College of Cardiology/American Heart Association Task Force on Clinical Practice Guidelines. 2017 Guideline for the Prevention, Detection, Evaluation, and Management of High Blood Pressure in Adults. J Am Coll Cardiol. Sep 2017, 23976; DOI: 10.1016/j.jacc.2017.07.745.

2. American College of Cardiology/American Heart Association Task Force on Clinical Practice Guidelines. Detailed Summary: 2017 Guideline for the Prevention, Detection, Evaluation, and Management of High Blood Pressure in Adults. November 13, 2017.

3. James Paul A., et al. 2014 Evidence-Based Guideline for the Management of High Blood Pressure in Adults. Report From the Panel Members Appointed to the Eighth Joint National Committee (JNC 8). JAMA. 2014;311 (5):507-520. doi:10.1001/jama.2013.284427

4. European Society of Cardiology/European Society of Hypertension. 2018 Arterial Hypertension Clinical Practice Guidelines. Reviewed and summarized by Medscape editors October 2, 2018. Viewed at: https://reference.medscape.com/viewarticle/902759

5. Basile, Jan MD., et al. Overview of hypertension in adults. September 25, 2018 ed: UpToDate; 2018.

6. Mann, Johannes FE, MD. Choice of drug therapy in primary (essential) hypertension. September 19, 2018 ed: UpToDate; 2018.

7. Egan, Brent M. Treatment of hypertension in older adults, particularly isolated systolic hypertension. November 30, 2017 ed: UpToDate; 2018.

8. Elliott, William J., et al. Evaluation and treatment of hypertensive emergencies in adults. October 30, 2018 ed: UpToDate; 2018.

9. 2013 ACC Reference: Goff, ACC.AHA Guideline on the Assessment of Cardiovascular Risk, 10/1016/ j.jacc.2013.11.005.

10. Wilson, Peter WF, MD. Cardiovascular disease risk assessment for primary prevention: Our approach. July 26, 2018 ed. UpToDate; 2019.

11. Qaseem, Amir, MD, PhD, MHA., et al., For the Clinical Guidelines Committee of the American College of Physicians and the Commission on Health of the Public and Science of the American Academy of Family Physicians. Annals of Intern Medicine 2017;166(6):430-437. 2017 American College of Physicians.

12. Muntner, Paul, et al. AHA Scientific Statement: Measurement of Blood Pressure in Humans, A Scientific Statement from the American Heart Association. Downloaded from: http://ahajournals.org by on March 5, 2019.

PATIENT EDUCATION/SELF MANAGEMENT

Blood Pressure and Hypertension: What You Should Know

WHAT IS BLOOD PRESSURE?

- Blood pressure is a measure of how hard the blood pushes against the walls of your arteries.

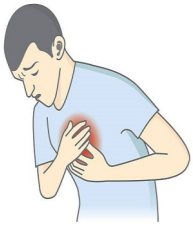
WHAT IS HIGH BLOOD PRESSURE?

- Another name for high blood pressure is hypertension.
- Blood pressure that is too high when you are at rest.

WHAT IS WRONG WITH HAVING HIGH BLOOD PRESSURE?

When blood pressure is high, it starts to damage the blood vessels, heart, kidneys, and eyes. Over time this high blood pressure can lead to:

- Heart attacks
- Strokes
- Blindness
- Kidney failure requiring dialysis
- Death



HOW IS HIGH BLOOD PRESSURE DIAGNOSED?

- Blood pressure consists of two numbers measured with a blood pressure cuff and stethoscope.
- These numbers are called **systolic** (pronounced si-stol-ik) pressure and **diastolic** (pronounced dahy-uh-stol-ik) pressure.
- The **systolic** number is how hard the blood pushes on the blood vessels when the heart is pumping. It is the top number and is the higher value of the two.
- The **diastolic** number is how hard the blood is pushing on the blood vessels between heartbeats. It is the bottom number and is the lower value of the two.
- You won't know if you have high blood pressure until it is checked by your medical team.
- High blood pressure is called a "silent killer" because it doesn't usually cause symptoms while it is causing damage to your body.
- The higher the numbers are, the more serious the concern for hypertension and risk of death.
- Go over the chart below with your medical team to make sure you understand high blood pressure.

BLOOD PRESSURE STAGES

Blood Pressure Category	Systolic mmHg *(Top #)*		Diastolic mmHg *(Bottom #)*
Normal	119 or below	And	79 or below
At Risk	120-139	And	80-89
High	140 or higher	Or	90 or higher

HOW IS HIGH BLOOD PRESSURE TREATED?

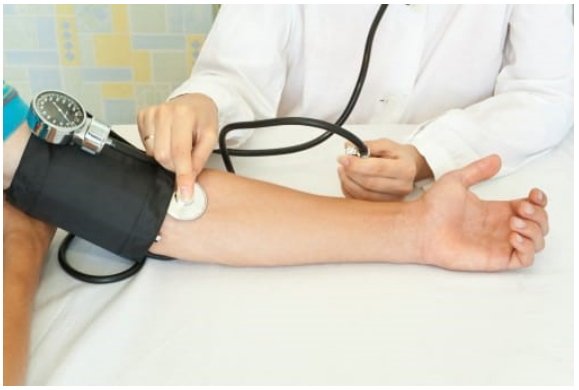
- **Medications:** There are many medications that can treat high blood pressure. Talk about your options with your medical team.
- **Lifestyle Changes:** There are also things you can do to help treat high blood pressure like exercise and eat healthy.

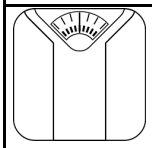
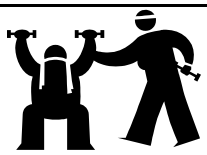
Patient Education/Self Management

Hypertension: What Should You Do?

Tips for having your blood pressure taken:

- ✓ Wear short sleeves so your arm is exposed.
- ✓ Don't drink coffee or smoke cigarettes 30 minutes before having your blood pressure measured.
- ✓ Avoid vigorous physical activity before your appointment.
- ✓ Go to the bathroom prior to the reading. A full bladder can change your blood pressure reading.
- ✓ Before the test, sit for five minutes with your back supported and your feet flat on the ground. Rest your arm on a table at the level of your heart.
- ✓ Ask the doctor or nurse to tell you the blood pressure reading numbers.



What your health care team will follow	How will you help yourself?
 Blood Pressure today:_____/_____ Blood Pressure last visit:_____/_____	Discuss your current and past blood pressure levels with your Primary Care Provider (PCP).
 Weight_____lbs Is this a healthy weight for me? Yes / No	Discuss your weight with your PCP.
 Is it safe for me to start doing regular physical activity? Yes / No	Discuss recommended physical activity with your PCP.
Are there any foods, beverages or other things I should avoid when my blood pressure is high?	✓ Avoid salt or foods high in salt (sodium) ✓ Caffeine may elevate blood pressure ✓ Avoid alcohol and quit smoking

Know Your Medication	Tips to Help You Remember to Take Your Blood Pressure Medications
What is the name of my blood pressure medication? _____ What are the possible side effects of my medication? _____ What should I do if I forget to take my blood pressure medicine at the recommended time? Should I take it as soon as I remember or should I wait until the next dosage is due? _____ _____	• Take your medications at the same time every day. Try to do it with something else that you do regularly, like brushing your teeth or eating a meal. • Try keeping a chart or calendar to write down when you take your medication. This is really helpful if you take more than one medication. • Each time you pick up a refill, make a note on your calendar to order and pick up the next refill one week before the medicine is due to run out. Remember to pick up your prescription every month. It will be automatically refilled as long as the prescription is active.

PATIENT EDUCATION/SELF MANAGEMENT

Hypertension: What You Should Know

MAINTAIN A HEALTHY WEIGHT

- Being overweight increases your risk of developing high blood pressure and makes it harder to treat.
- Losing even 10 pounds can lower blood pressure.
- Discuss your weight with your health care team.

EXERCISE

- Being physically active is one of the most important steps you can take to prevent or control high blood pressure.
- Do an aerobic activity like walking at least 30 minutes five days a week.

REDUCE SODIUM (SALT) IN YOUR DIET

- We all need a small amount of sodium to keep our bodies working well, but most of us consume way too much.
- High salt diets can raise your blood pressure, which may cause heart disease or a stroke.
- Do not add salt to your food.
- Try to avoid foods with added salt especially items from the canteen like salted nuts or chips and other processed foods.
- When salt intake is lowered, blood pressure levels can lower within weeks.

EAT MORE FRUITS AND VEGETABLES

CUT DOWN ON CAFFEINE

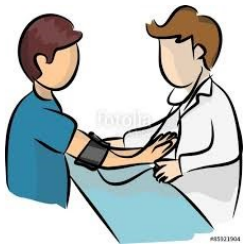
DON'T SMOKE!

TAKE YOUR MEDICATIONS AS DIRECTED

- Talk to your medical provider if you are having problems with a medication
- Do not stop your medication without discussing it with your health care team

KNOW YOUR NUMBERS

- Ask your doctor what your blood pressure values are at each visit and how those compare to past visits.
- Talk to your health care team about what you can do to help lower your blood pressure.



EDUCACIÓN PARA EL PACIENTE/CONTROL PERSONAL DEL CASO

PRESIÓN ARTERIAL E HIPERTENSIÓN: lo que debe saber

¿QUÉ ES LA PRESIÓN ARTERIAL?

- La presión arterial es la medida de la fuerza con la que la sangre empuja las paredes de las arterias.

¿QUÉ ES LA PRESIÓN ARTERIAL ALTA?

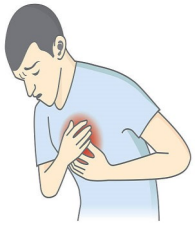
- A la presión arterial alta también se le conoce como hipertensión.
- La presión arterial es muy alta cuando usted está en reposo.

¿CUÁL ES EL PROBLEMA DE TENER PRESIÓN ARTERIAL ALTA?

Cuando la presión arterial es alta comienza a dañar los vasos sanguíneos, el corazón, los riñones y los ojos.

Con el tiempo, la presión arterial alta puede provocar:

- Ataques cardiacos
- Derrames cerebrales
- Ceguera
- Fallo renal que requiera diálisis
- Muerte



¿CÓMO SE DIAGNOSTICA LA PRESIÓN ARTERIAL ALTA?

- La presión arterial consiste en dos números medidos con un tensiómetro y un estetoscopio.
- A estos números se les conoce como presión **sistólica** y presión **diastólica**.
- El número sistólico indica la fuerza con la que la sangre presiona los vasos sanguíneos cuando el corazón bombea. Es el número que aparece arriba y el valor más alto de los dos.
- El número **diastólico** indica la fuerza con la que la sangre presiona los vasos sanguíneos entre los latidos. Es el número que aparece abajo y el valor más bajo de los dos.
- Usted no sabrá si tiene presión arterial alta hasta que lo revise su equipo médico.
- La presión arterial alta se conoce como un "asesino silencioso" porque, por lo general, no provoca síntomas mientras daña su cuerpo.
- Entre más altos sean los números, la inquietud sobre hipertensión y el riesgo de muerte son más graves.
- Revise la siguiente tabla con su equipo médico para asegurarse de que sabe sobre la presión arterial alta.

ETAPAS DE LA PRESIÓN ARTERIAL ALTA

Categoría de la presión arterial	Presión sistólica en mmHg (N.º superior)		Presión diastólica en mmHg (N.º inferior)
Normal	119 o menor	y	79 o menor
En riesgo	entre 120 y 139	y	entre 80 y 89
Alta	140 o mayor	o	90 o mayor

¿CÓMO SE TRATA LA PRESIÓN ARTERIAL ALTA?

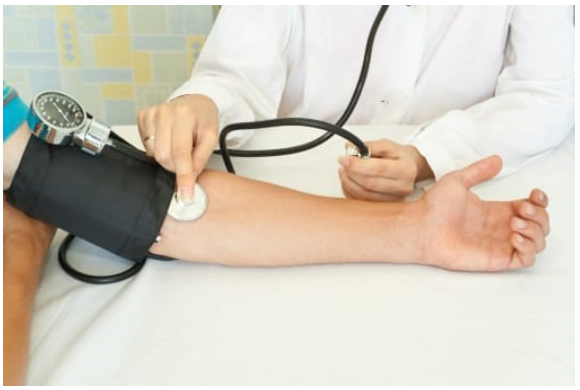
- **Medicamentos:** Hay muchos medicamentos para tratar la presión arterial alta. Hable con su equipo médico sobre sus opciones.
- **Cambios en el estilo de vida:** También hay cosas que puede hacer para ayudar a tratar la presión arterial alta, como hacer ejercicio y tener una alimentación saludable.

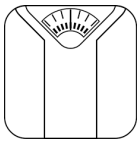
EDUCACIÓN PARA EL PACIENTE/CONTROL PERSONAL DEL CASO

HIPERTENSIÓN: lo que debe hacer

CONSEJOS PARA QUE MIDAN SU PRESIÓN ARTERIAL:

- ✓ Use mangas cortas para que su brazo esté expuesto.
- ✓ No beba café ni fume durante 30 minutos antes de que le midan la presión arterial.
- ✓ Evite realizar actividad física vigorosa antes de su cita.
- ✓ Vaya al baño antes de la medición. Una vejiga llena puede cambiar la medición de su presión arterial.
- ✓ Antes de la prueba, siéntese por cinco minutos recargado sobre la espalda y con los pies apoyados en el piso. Descanse su brazo en una mesa al nivel de su corazón.
- ✓ Pida al médico o enfermera que le diga los números de su presión arterial.



LO QUE SU EQUIPO DE ATENCIÓN MÉDICA HARÁ	¿CÓMO PUEDE AYUDARSE A SÍ MISMO?
Presión arterial de hoy:_____/_____ Presión arterial de la última consulta:_____/_____	Hable con su proveedor de atención primaria (Primary Care Provider, PCP) sobre sus niveles de presión arterial actuales y anteriores.
 Peso_____libras ¿Es un peso saludable para mí? Sí / No	Hable con su PCP sobre su peso.
¿Es seguro para mí comenzar a realizar actividad física de manera regular? Sí / No	Hable con su PCP sobre la actividad física recomendada.
¿Hay algún alimento, bebida u otra cosa que debería evitar cuando mi presión arterial sea alta?	✓ Evite la sal o los alimentos con alto contenido de sal (sodio). ✓ La cafeína puede elevar la presión arterial. ✓ Evite el alcohol y deje de fumar.
CONOZCA SUS MEDICAMENTOS	**CONSEJOS PARA AYUDARLE A RECORDAR TOMAR SUS MEDICAMENTOS PARA LA PRESIÓN ARTERIAL**
¿Cuál es el nombre de mi medicamento para la presión arterial? _____ ¿Cuáles son los posibles efectos secundarios de mi medicamento? _____ ¿Qué debo hacer si olvido tomar mi medicamento para la presión arterial a la hora recomendada? ¿Debería tomarlo en cuanto me acuerde o debería esperar hasta que sea la hora de la siguiente dosis?	• Tome sus medicamentos todos los días a la misma hora. Intente hacerlo al mismo tiempo que algo que haga regularmente, como cepillarse los dientes o comer. • Intente llevar una tabla o un calendario para r egistrar cuando tome su medicamento. Esto es bastante útil si toma más de un medicamento. • Cada vez que recoja un resurtido, haga una anotación en su calendario para ordenar y recoger el siguiente resurtido una semana antes de que se vaya a acabar el medicamento. Recuerde recoger el medicamento cada mes. Se resurtirá automáticamente siempre que la receta médica esté activa.

EDUCACIÓN PARA EL PACIENTE/CONTROL PERSONAL DEL CASO

Hipertensión: lo que debe hacer

MANTENGA UN PESO SALUDABLE

- Tener sobrepeso aumenta su riesgo de desarrollar presión arterial alta y dificulta el tratamiento.
- Bajar al menos 10 libras puede disminuir la presión arterial.
- Hable con su equipo de atención médica sobre su peso.

HAGA EJERCICIO

- Estar activo físicamente es uno de los pasos más importantes que puede tomar para prevenir o controlar la presión arterial alta.
- Haga una actividad aeróbica, como caminar, durante al menos 30 minutos, cinco días a la semana.

REDUZCA EL SODIO (SAL) DE SU DIETA

- Todos necesitamos una pequeña cantidad de sodio para que nuestros cuerpos trabajen bien, pero la mayoría consume demasiado.
- Las dietas altas en sal pueden elevar su presión arterial, lo que puede causar enfermedades cardiacas o un derrame cerebral.
- No agregue sal a sus alimentos.
- Evite los alimentos con sal añadida, especialmente los productos de la cantina, como las nueces o papas saladas, y otros alimentos procesados.
- Cuando se reduce el consumo de sal, los niveles de presión arterial pueden disminuir en pocas semanas.

COMA MÁS FRUTAS Y VERDURAS

REDUZCA LA CAFEÍNA

¡NO FUME!

TOME SUS MEDICAMENTOS COMO SE LE INDICÓ

- Hable con su proveedor médico si tiene problemas con un medicamento.
- No suspenda sus medicamentos sin hablarlo con su equipo de atención médica.

CONOZCA SUS NÚMEROS

- Pregunte a su médico en cada consulta cuáles son los valores de su presión arterial y cómo se comparan con los de consultas pasadas.
- Hable con su equipo de atención médica sobre lo que puede hacer para reducir su presión arterial.